

FLIGHT

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AND AIRSHIPS

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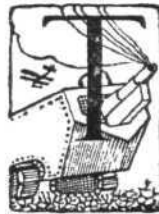
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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- 1931
- July 10-12. R.A.F. Athletic Championships.
- July 10-19. Circuit of Italy.
- July 13-16. Lawn Tennis: R.A.F. Championships at Wimbledon.
- July 15. Opening of Roborough Aerodrome, Plymouth, by H.R.H. the Prince of Wales.
- July 15-16. Cricket. R.A.F. v. Civil Service at Uxbridge.
- July 18. Ramsgate Air Rally.
- July 18. Lincolnshire Ae.C. Air Pageant, Cleethorpes.
- July 18. T.M.A.C. Visit to Halton.
- July 22. Household Brigade Flying Club Meeting, Heston.
- July 25. King's Cup Race.
- July 25-30. Conference on Medical Utility of Aviation in the Colonies, at International Colonial Exhibition, Paris.
- July 25-Aug. 9. Rhon Gliding Competitions, Germany.
- July 27-28. Cricket. R.A.F. v. Free Foresters at Camberley.
- Aug. 1-2-3. Southdown Skysailing Club's Annual Flying Meeting.
- Aug. 3-4. Cricket. R.A.F. v. R.N. at Halton.
- Aug. 15. Scarborough Ae.C. Air Pageant.
- Aug. 15. Manchester-Liverpool Inter-City Race.
- Aug. 22. Newcastle-on-Tyne Meeting.
- Sept. 5. Norfolk and Norwich Ae.C. Display at Yarmouth.
- Sept. 5. Haldon Flying Meeting.
- Sept. 12. Schneider Trophy Contest.
- Sept. 26. Garden Party, Bristol and Wessex Ae.C.

EDITORIAL COMMENT



TAKEING it all around, British civil aviation has, during the last ten years or so, had a history remarkably free from accidents traceable to structural failure. In the large commercial class of aircraft there is no case on record of a machine having crashed as a result of breakage of a wing or other main structure member. Of light aircraft used by private owners Great Britain now has a far greater number than any other country, and yet here, also, the total number of accidents has been relatively small, while among those which have occurred a very small percentage indeed have definitely been proved to have been caused by a structural breakage. When one remembers that many British light aircraft are now used in climatic conditions which differ very materially from those obtaining at home, and that once a light aeroplane leaves the makers' works and goes overseas, it passes right out of their control, this is really rather remarkable. British Certificates of Airworthiness are based on load factors which time and experience have proved to be sufficient for normal conditions at home, but there would seem to be just a possibility that they may have to be revised with overseas conditions in view.

In this issue we publish, on our Correspondence page, a letter from Mr. C. C. Walker, of the De Havilland Company, in which he calls attention to two accidents to De Havilland "Puss Moth" machines definitely traced to structural failure, and more particularly to wing breakage. The action of the De Havilland Company in thus frankly coming into the open and freely discussing the subject, is one which is to be admired. As the British firm which has produced far and away more light aeroplanes than any other company, and which has in use at home and throughout the world very large numbers of machines, the De Havilland Company may be assumed to have accumulated a wider practical experience of light aeroplane use, under the most varying climatic conditions, than probably any other firm in the world. The number of accidents has been remarkably low, all things considered, and

it would have been very easy for the firm to keep silent about the matter and quietly to go to the various owners and get modifications made without the world in general knowing anything about it. That the De Havilland Aircraft Company, Ltd., should have chosen the other alternative and decided to state in print the actual position is a sign not only of that honesty in dealing with their customers, which has done so much to build up the De Havilland business, but also of a faith in their products, which faces the facts seriously and frankly, and admits that conditions, particularly overseas, may be such that the load factors hitherto employed, and, generally speaking, found adequate, may need revision.

If we look back, it is found that during the last year or so, the De Havilland Aircraft Company, Ltd., has sold something like 200 "Puss Moth" machines, which have flown in the neighbourhood of two million miles. Of notable flights made by "Puss Moths" it is necessary to recall only a few, such as Mr. Caspareuthus' flight to the Cape, Captain Hope's flight to Abyssinia and back, and Captain C. D. Barnard's various non-stop long-distance flights. In none of these did the machines show the slightest signs of structural weakness.

Static tests have now been carried out on no less than ten separate "Puss Moth" wings, some taken from machines with months of tropical service behind them, and it is known for certain that all the strength requirements of the class of aircraft are met.

The two accidents referred to in Mr. Walker's letter are the only cases of failure in the air, as it is considered fairly certain that the damaged spar in Captain Mathews' machine must have sustained its damage on the ground, a view, we gather, which Captain Mathews himself shares. The Australian accident occurred in clouds, and it is known that a clean machine like the "Puss Moth" can reach very high speeds rapidly. Not only so, but atmospheric conditions themselves may, according to a member of the American National Advisory Committee for Aeronautics, occasionally be such that extremely high stresses can be thrown on a fast machine flying into a sharp-edge region of vertical currents, stresses so great that no aircraft ever built would be able to withstand them.

The accident, which cost Lieut.-Commander Kidston his life, occurred in a pass which is infamous locally for its violent weather, and it is highly probable that the machine was thrown about in a manner which would be the exact equivalent of stunting. If, as seems to have been the case, the machine was heavily loaded, it is not surprising that a breakage occurred. A machine is given a Certificate of Airworthiness for one gross weight for "Aerobatics" and another, and much larger, for normal flying. If, therefore, a machine loaded up to the normal gross weight is, unintentionally, called upon to perform various evolutions in very rough weather, this may readily become the equivalent of aerobatic evolutions at normal gross weight, and structural

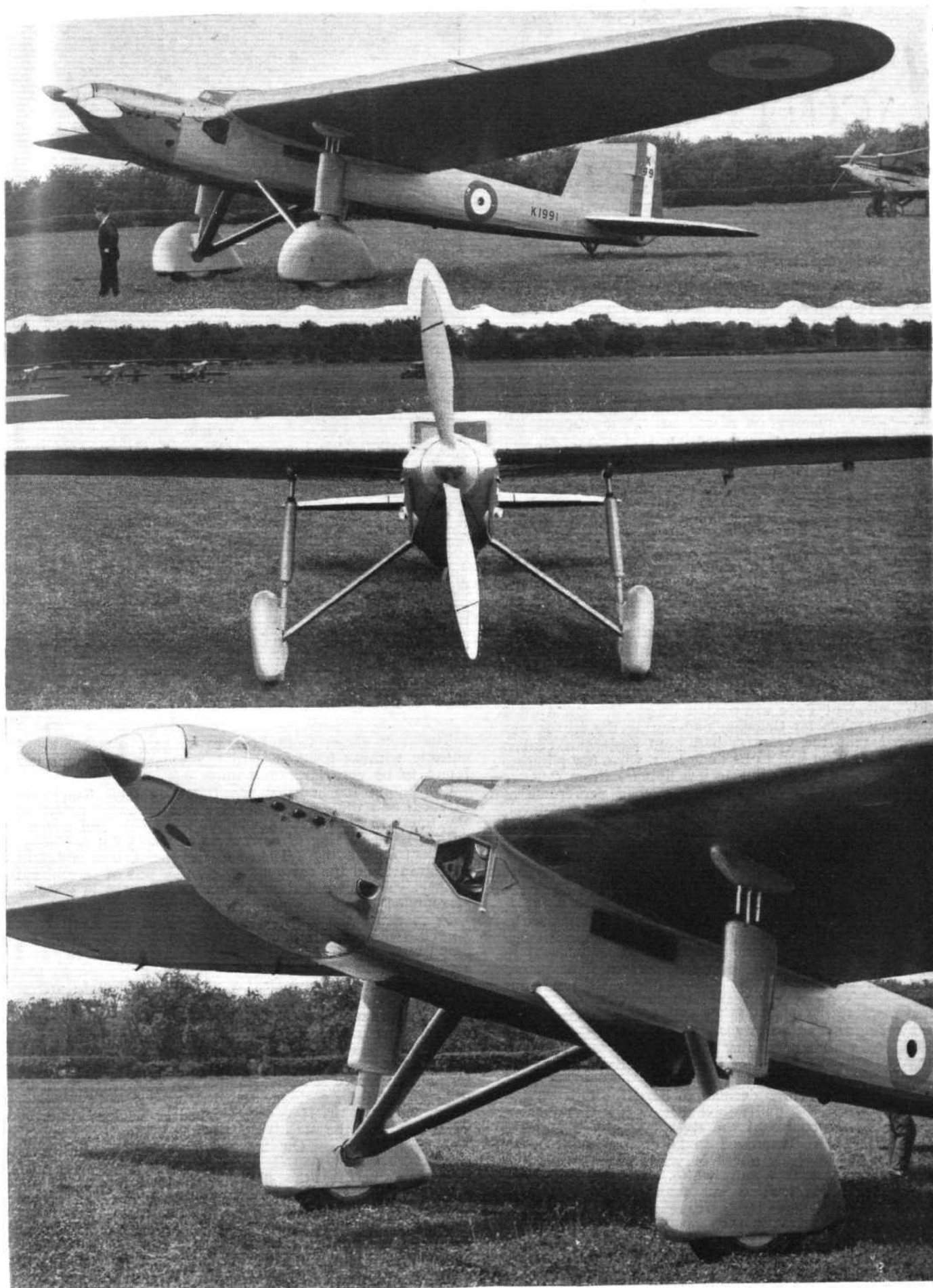
failure may be expected. In this connection it is interesting to learn that the South African accident showed a fracture of the rear spar in exactly the same place where fractures are obtained on static tests with large incidence loading.

From the fact that, as far as can be ascertained the British Air Ministry does not intend to issue any Notice to Ground Engineers about the "Puss Moth," it may be inferred that the Airworthiness Department is satisfied that the load factors of this machine are up to standard. The De Havilland Company has, however, decided to carry out certain modifications with a view to guarding against intentional or unintentional misuse, so that in future all "Puss Moth" machines will have not only the load factors demanded by the British Air Ministry but additional safety measures, which should guard against structural failure from conditions of use and handling which are not readily foreseen.

The question will naturally be asked whether a change in the load factors used at present should not be made? In certain service types the factors have recently been altered to 9 forward and 6 back, but although the tendency, in light aeroplanes also, is towards greater and greater speed, there is probably no reason to change the existing factors, which have on the whole, proved adequate. One firm has already taken steps to increase, without, of course being compelled to do so, its "factors of ignorance" (to quote an expression of Mr. J. D. North's), and should the need arise, any other firm is at liberty to do the same. It will be obvious that much depends upon the locality in which a light aeroplane is to be used and the manner in which it is to be used. There is little doubt that certain weather conditions, of disturbed air and poor visibility, may constitute a danger in causing an aircraft to get into attitudes not intended. Apart from a strengthening of machines to take care of such conditions (and there are manoeuvres which no aircraft ever built will withstand), it would seem that training in flying by instruments might do much to reduce the risk of certain kinds of flying. The new school recently established at Hamble by the Armstrong-Siddeley group (Air Service Training, Ltd.) makes provision for thorough training in instrument flying, and it may well be that this form of training, which has hitherto been regarded chiefly as a specialised form of instruction, could with advantage be extended and taken into more general use. Whether the time has come for instrument flying to be part of the tests for an "A" licence may, perhaps, be open to doubt. On the other hand, a pilot who includes instrument flying among his accomplishments should be in a position to undertake with a fair degree of safety flights which might otherwise include a not inconsiderable element of risk.

In any case, we consider that the De Havilland Aircraft Co., Ltd., has done the whole British aviation community a service by drawing attention to a subject which may well become one of very great importance in the near future.





THE FAIREY LONG-RANGE MONOPLANE: The new machine is now completed and has been flying. Like the first machine, it is fitted with a Napier "Lion" engine. Refinements have been added to this second machine, such as the spats over the undercarriage wheels. The centre photograph indicates how "clean" the new machine is. (FLIGHT Photos.)

THE CRUISE OF A "CUTTY SARK"

During the period March 26 to April 23, 1931, a SARO "Cutty Sark" amphibian flying boat, fitted with two 120 h.p. Gipsy II engines, made a tour of some 3,000 miles across Europe, visiting many places where an amphibian aircraft had never been seen before. The abbreviated version of the log which follows tells the story of this unusual cruise

THE cruise of a "Cutty Sark" started from the Saunders-Roe works at Cowes, Isle of Wight, about midday on March 26. The aircraft was one of the original machines of the type, and carried the registration letters G-AAIP. On board at the start were Captain H. Balfour, M.P., and Flight-Lieutenant Pope, and Heston Air Park was reached during the afternoon. Next morning an early start was made from Heston, Lord Lymington joining the "Cutty Sark" there.

The first port of call was Brussels, the journey being made without incident, but on alighting some slight damage was sustained, due to an almost invisible wire fence catching one wing tip float and damaging the undercarriage. Replacements were sent out to Brussels from the Saunders-Roe works at Cowes, and, with the aid of Messrs. Fryer and Emmett, of Imperial Airways, the damaged parts were replaced during the week-end.

At Brussels Captain S. D. Scott, Chief SARO test pilot, and Inspector Hancock joined the machine, while Flight-Lieutenant Pope returned to England. On April 2 a start was made for Cologne, and during the trip it was discovered that the compass had been somewhat shaken up, and navigation had to be done from what few glimpses of the sun could be got during low flying. From Cologne a course was set for Würzburg, the small aerodrome of which, situated at a height of 800 ft. above sea-level, Captain Scott was able to locate. The good people of Würzburg were found to be most charming, and nothing would do but they must remove their own machines from the small shed so that the "Cutty Sark" might be housed for the night. Next morning it was discovered that the Würzburgers had not let their hospitality confuse their idea of business, for there was an additional charge to be paid for the storage of the "Cutty Sark." As the English machine was much better able, and indeed accustomed to spend nights in the open than the German light planes and gliders, the incident was not without its humorous side.

Next morning the wind was blowing across the 300 yards wide aerodrome, and permission was therefore asked, and granted, to embrace in the take-off area an adjacent gliding slope. This soon put the "Cutty Sark" into the air, and the flight to Nürnberg was made without incident.

From Nürnberg it was decided to head for Linz on the Danube, where it was understood there was an aerodrome. By following the course of the river, the aerodrome was eventually located. It proved to be a mere strip, some 800 yards long, but only about 50 yards wide. From the air the aerodrome looked quite white. When the machine had landed the explanation was found. The aerodrome was being rebuilt, and the earth employed was nearly white. Among the first on the scene were the local police, who practically placed the amphibian under arrest while the "papers" were being looked into. The situation was eased by the diplomacy of Captain Scott, who made the police responsible for the safety of the machine, a task which took all their time, and left the "prisoners" more or less free to roam at will. When the papers had been cleared, petrol was asked for, and when this arrived it turned out to be of a pink variety. The local people were surprised to learn that the "Gipsy" engines would run on ordinary petrol.



Captain S. D. Scott, Saunders-Roe's chief test pilot, who piloted the "Cutty Sark" on her cruise.

The next stage, from Linz to Vienna, was completed entirely without incident, and the Vienna aerodrome was found to be very large and quite flat.

Continuing the journey the following day, Gratz was reached, and the aerodrome there was found to be one of the finest in the world, being of large size and covered with a thick coating of hard moss of wonderful resiliency, excellent for landing. The amenities included an excellent restaurant, and the surrounding scenery was of exceptional beauty. The town and aerodrome are situated in a valley surrounded by mountains.

From Gratz the journey was continued, on April 7, to Zagreb, where a wonderful reception was accorded the amphibian and its crew. The representatives of the local aero club and air force were loud in their praise and admiration of this new British product. An early arrival on the aerodrome was Mr. T. G. Mapplebeck, a prominent British trade representative in Yugoslavia.

The better part of the day was spent at Zagreb in cleaning and generally overhauling the "Cutty Sark," which had had no attention given her since leaving Cowes a fortnight before. A close examination showed that, apart from cleaning up, nothing needed doing except lubricating.

From Zagreb Mr. Hancock returned to England, and the vacant seat in the "Cutty Sark" was then occupied by Mr. Mapplebeck. On leaving Zagreb, Captain Scott climbed to some 7,000 ft. so as to get a good start over the mountains for the flight down to Sushak on the Adriatic Sea. Arriving at Sushak the advantages of the amphibian were demonstrated in a most convincing manner. This arose out of a phenomenon well known in the Eastern Adriatic and called the "Bora." The winds off the mountains are deflected downward and strike the water some distance out from the shore, causing a very disturbed belt of sea, with smooth water outside and inside it. In the actual downward current an aircraft would have a very uncomfortable time, and the method followed by the "Cutty Sark" was to alight outside the belt of rough sea, taxi through it into the calm stretch of water near the shore, and on to the beach.

While waiting for the "Shell" agent to send a supply

of petrol, the crew lunched ashore, and after lunch the amphibian took off from the sea and, climbing to 3,000 ft., reached the neighbourhood of the small lake Bled. The lake appeared of such small size, and was surrounded by such high banks, that it was decided that although the "Cutty Sark" could easily alight, it would have difficulty in getting off, and so the travellers continued on to Ljubliana, which is the Yugoslavian part of the international Port of Fiume. No aerodrome could be found, but a landing was made on a likely-looking piece of land. This turned out to be a dog racing track, and the part on which the landing was made was raised some three feet above the rest, so that considerable skill on the pilot's part was required. For all that, several demonstration flights were made quite successfully before the machine made its return flight to Zagreb.

The next day, April 10, was devoted to a series of demonstration flights at Zagreb before the Colonel Commandant and officers of the Yugoslav Air Force, and representatives of the Aero Club. In the evening the crew of the "Cutty Sark" were the guests of the Colonel Commandant at a dinner.

In the morning the "Cutty Sark" set off for the Island of Rabe, a small island between Sushak and Bled. The "Bora" here was in full force, and had whipped up a nasty sea along a belt between the island and the mainland. However, the amphibian was put down without difficulty on the sea off the island, and taxied into the tiny harbour, where it was secured with its lowered wheels on the mud and its nose against the quayside. Petrol was taken on board in cans, and after refuelling the machine was started by people ashore holding on to the tail while the engines were run up. As a swell had got up in the meantime, the "Cutty Sark" was flown to a point nearer the coast of the mainland, where the water was smooth. Floating almost motionless on the smooth sea, the amphibian took her time in transferring the petrol to the tanks, and with these filled she took the air again and made a coastal flight along a very beautiful coast to the fortified town of Split. This proved to be a pleasant town with a delightful harbour full of small ships and bathers. The "Cutty Sark" was

put on a buoy while the crew went ashore to be received by the Commander-in-Chief of the Yugoslav navy, who arrived in an aircraft carrier! A flight was made to the naval air station, situated some little distance away, with the Commander-in-Chief as a passenger. Here the "Cutty Sark" alighted on the sea and, lowering her wheels, taxied up the slipway on to the aerodrome. Here again the British amphibian came in for much favourable comment, and the crew spent a very pleasant time until evening,

when a flight was made back to Split. The coast line of the Eastern Adriatic is ideal for flying boat operation, as shelter can always be found in the lee of one of the islands of the chain which runs along the coast.

The next day a flight was made from Split to Dubrovnik, which is a place of great natural beauty, possessing a large sheet of land-locked water. An alighting was made on the water and, the machine taxying up to the beach with wheels lowered, a mooring line was made fast ashore.

From Dubrovnik the machine flew along the coast line to a pass in the mountains, and climbing to 8,000 ft. a flight was made between snow-clad mountains and banks of cloud to Sarajevo, the aerodrome of which is situated 2,000 ft. above sea-level. At Sarajevo the crew of the "Cutty Sark" were given a tremendous welcome, and in the evening were entertained at dinner

by the Colonel commanding Sarajevo aerodrome, at which the President of the Sarajevo Aero Club and many members and officers were present.

On leaving Sarajevo it was necessary to climb to 7,000 ft. to get over the mountains surrounding this town, and this used up a good deal of petrol, so that it became doubtful if Belgrade could be reached that evening. Again the amphibian proved her worth, for it was found possible to alight on the Drina river, in a 9-knot current, and taxi the machine up to the banks, where the local people supplied a quantity of petrol. A start was made, but some time had been lost, and as the travellers flew on darkness began to set in, while a strong head wind delayed them further. Flying was continued until it grew quite dark, and then, some lights twinkling below indicating a

LOG OF THE "CUTTY SARK"		
MARCH 26-APRIL 23, 1931		
Date.		Journey.
March 26	..	Cowes to Heston.
" 27	..	Heston-Brussels.
April 2	..	Brussels-Cologne-Würzburg.
" 3	..	Würzburg-Nürnberg.
" 4	..	Nürnberg-Linz.
" 5	..	Linz-Vienna.
" 6	..	Vienna-Gratz.
" 7	..	Gratz-Zagreb.
" 8	..	Zagreb-Rabe Island-Zagreb.
" 9	..	Zagreb-Susak-Bled-Ljubliana-Zagreb.
" 10	..	Demonstration at Zagreb.
" 11	..	Zagreb-Split.
" 12	..	Split-Naval Air Station-Split.
" 13	..	Split-Dubrovnik.
" 14	..	Dubrovnik-Sarajevo.
" 15	..	Sarajevo-Shabac.
" 16	..	Shabac-Belgrad.
" 17	..	Demonstrations at Belgrad (Military).
" 18	..	Demonstrations at Belgrad (Civil).
" 19	..	Belgrad-Budapest.
" 20	..	Budapest-Vienna.
" 21	..	Vienna-Linz-Nürnberg-Frankfort.
" 22	..	Frankfort-Cologne-Brussels-Lympne.
" 23	..	Lympne-Cowes.



LOCAL INTEREST: The "Cutty Sark," with a few admirers, at Sarajevo.

village, a landing was made in the dark, and after some trouble the machine was brought in and held to the steep bank by the villagers. After a search a mooring place of sorts was found between some barges, where the "Cutty Sark" was left for the night, the crew walking to the village of Shabac. The following morning the machine took off the Sava river without difficulty, and arrived at the Belgrade aerodrome, where the day was spent in cleaning up.

From the civil aerodrome at Belgrade the "Cutty Sark" flew to the military aerodrome at Novi Sad, where arrangements had been made to demonstrate the machine before the General commanding the Division, the Commandant of the Air Force, and technical representatives. Practically the whole day was occupied in taking up people and in making demonstrations, taking off the aerodrome, alighting on the river, taking off the river and landing on the aerodrome. Many of the local pilots were allowed to fly the machine. The next day was spent at the Belgrade civil aerodrome, giving demonstrations before the British Minister, the managing director of the Yugoslav Air Navigation Company, technical officials, and members of the Belgrade Aero Club.

The next day the excellent aerodrome at Budapest was reached, and on the following day the flight to Vienna had to be made in continuous rain. Owing to the poor visibility the river Danube was followed at a height of about 50 ft.

On April 21 the return flight was begun. Flying via Linz and Nürnberg, Frankfurt was reached that day, and



Sketch Map of the route followed by the "Cutty Sark."

the night spent there. The next day a start was made at 11.30 a.m., and in very bumpy weather the flight was made down the Rhine to Cologne, where the travellers lunched. In the afternoon, owing to very bad visibility, a compass course was set for Brussels, which was duly reached, and after petrol for the engines and coffee for the crew the journey was continued to Lympe. There would have been time to get to Cowes that night, but as the Customs Official had left for the night, the last stage, to Cowes, was not flown until the following day.

CORRESPONDENCE

[The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.]

STRENGTH OF THE PUSS MOTH

[2755] In view of the currency of certain rumours concerning the Puss Moth, the Directors of the De Havilland Aircraft Company, Limited, feel it desirable to make the following statement to correct any inaccurate impressions which may exist.

As originally designed, the Puss Moth complies with the strength requirements of its class. This has been verified by a series of static tests and in the most thorough manner and is not open to doubt. During the past twelve months approximately 200 machines of this type have been sold, and have done upwards of two million miles' flying in all parts of the world.

Two accidents have, however, occurred, in which it was found that the wing structure had failed. The first happened in Australia in October, 1930, and, although the evidence available was very scanty, there appeared some indication of wing flutter having developed. As a result of this accident, however, it was decided, after consultation with the Air Ministry, to incorporate certain modifications to the wings and ailerons in order to eliminate the possibility of "flutter" insofar as this is possible from the most recent knowledge of this phenomenon and its cause, and all Puss Moths now embody these modifications.

The second accident took place in South Africa recently. For reasons outside the responsibility of this Company, the machine in question had not been modified as referred to above; it was flying overloaded and in weather of an exceptionally violent nature. In this instance the evidence disposed of the likelihood of wing flutter.

While much experience is available which shows that the existing scale of primary load factors is entirely satisfactory, the continually-widening conditions under which aircraft are being used may give rise to trouble in directions which cannot readily be foreseen. It may be pointed

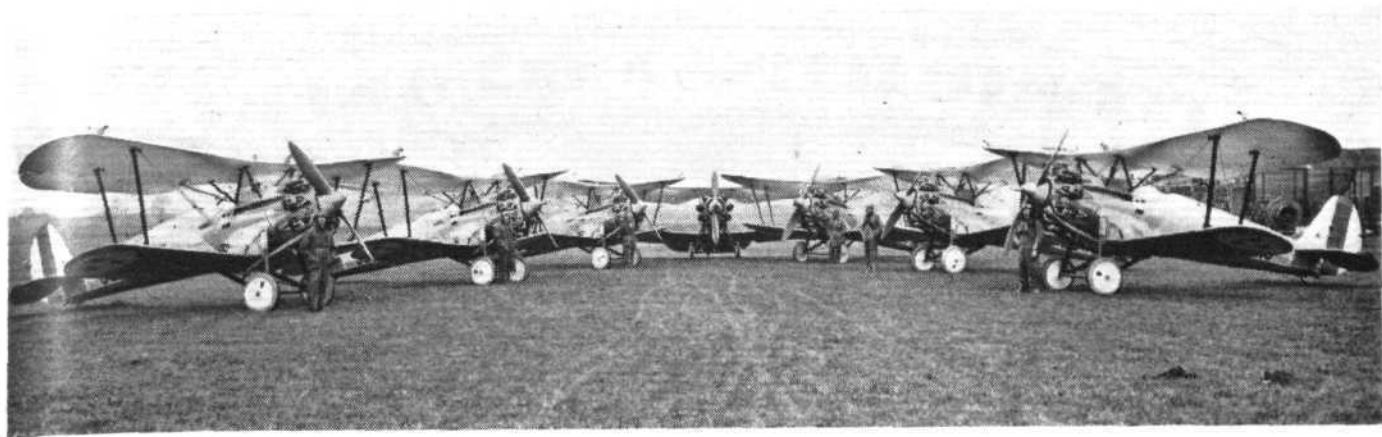
out, for instance, that the degree of maintenance and attention which aircraft receive, is a variable quantity, and it is found that in some parts of the world bracing is allowed to become very slack, that constant overloading may be indulged in, that wings may be folded without jury struts in position and then roughly man-handled, that minor accidents on the ground may strain a machine. All these, and many other things can cause deformations in the structure, which may alter the distribution of loads in a way that is difficult to predict, and, while it is obviously not possible to guard against every kind of misuse or accident, the Company consider it desirable to introduce modifications which generally stiffen and strengthen the wing structure above the normal requirements. These modifications, incidentally, have the effect of substantially increasing the primary load factors in some of the most important members, but their main object is to add a large measure of security against what may be described as secondary causes of trouble.

In view of the conditions which have been shortly referred to above, the Company would strongly urge all owners of Puss Moths, in their own interests, to have these modifications incorporated as early as possible. We should also be extremely grateful if you would give this suggestion the fullest possible publicity, because, so far as we are aware, no Ground Engineers' Notice is being issued.

The Company is prepared to make special arrangements which will enable these modifications to be carried out with the minimum of expense and inconvenience to the owners.

C. C. WALKER,
Director and Chief Engineer.

The De Havilland Aircraft Co., Ltd.,
Stag Lane Aerodrome,
Edgware, Middlesex.



"BULLDOGS" FOR SWEDEN

A Small "Fleet" Flown Across Recently

SOME months ago the Swedish Government ordered from the Bristol Aeroplane Company a number of Bristol "Bulldog" single-seater fighters fitted with the Bristol "Jupiter" Series VII.F. supercharged engines. The order was placed with a view to enabling the Swedish Air Force to make thorough tests over an extended period before committing itself to the choice of this type for the general equipment. The trials included service throughout a rigorous Swedish winter.

So satisfied were the Swedish authorities with the results obtained that they recently placed an order with the "Bristol" firm for yet another eight machines of the "Bulldog" type. These machines were finished some little

time ago, and performance tests were carried out at Filton to the full satisfaction of a Swedish Acceptance Commission, composed of Flight-Lieutenant Ekman and Engineer-Lieutenant Count Sparre. The upper photograph on this page shows seven of the "Bulldogs" lined up, each with its Swedish pilot standing in front of it, prior to flying to Sweden; while in the lower picture the machines are seen in the Bristol shops at Filton. Note the Swedish system of identification by three crowns and a number.

In connection with this latest order for "Bulldogs," it is of interest to note that this machine is now the standard single-seater fighter of no less than nine nations, four of which are situated around the shores of the Baltic.



PRIVATE FLYING & CLUB NEWS

"HOSPITALITY"

THE private owners of the Norfolk and Norwich Aero Club, with Mr. Fred Gough as their prime mover, decided that they would like to repay a little of the hospitality which they had had from the hands of the private owners of other clubs. The result was one of the best parties which anyone has ever had.

Last Saturday afternoon some forty aircraft arrived from all parts of the country, and were welcomed by Messrs. Gough, Surtees, Brett, and Cubitt, bunches of tickets were shoved into their hands, and they were told to jolly well enjoy themselves . . . which they did!

Tea in the Club House was the first item to be overcome, and much less than "seven baskets full" remained! After this the whole party were conveyed down to the Bell Hotel, where accommodation had been reserved for them.

The organisation of Mr. Gough then continued its excellent control, and the party found themselves in cars heading for Wroxham, where dinner was eaten in the King's Head Hotel. Being now (temporarily) satiated with good food and wine, the party was in the mood for slower travel, accompanied with music, and the thoughtful "organisers" provided a large launch, which carried them towards Horning. On the way, music emanated from an accordion most ably handled by one Williams from Canada, who is said to have some connection with an oleaginous product whose trade mark is the housing of the genus mollusca.

At Horning it was found that a dance was in progress, to which all were welcome, and several further hours passed happily there. Later, or one should say earlier the next morning, the whole party returned to the Club House at Mousehold, and were regaled with "Ham and Eggs" until repletion called a halt to both digestive and ballistic processes.

The following day, Sunday, the whole party went over to Mr. Pat Cubitt's place at Bacton on the coast, and were treated to a picnic lunch on the sand dunes. Mr. Surtees, being an electrical engineer, had exercised his ingenuity and provided music which was broadcast. The opportunity for sea and sun bathing was naturally taken advantage of, and probably also regretted by many of

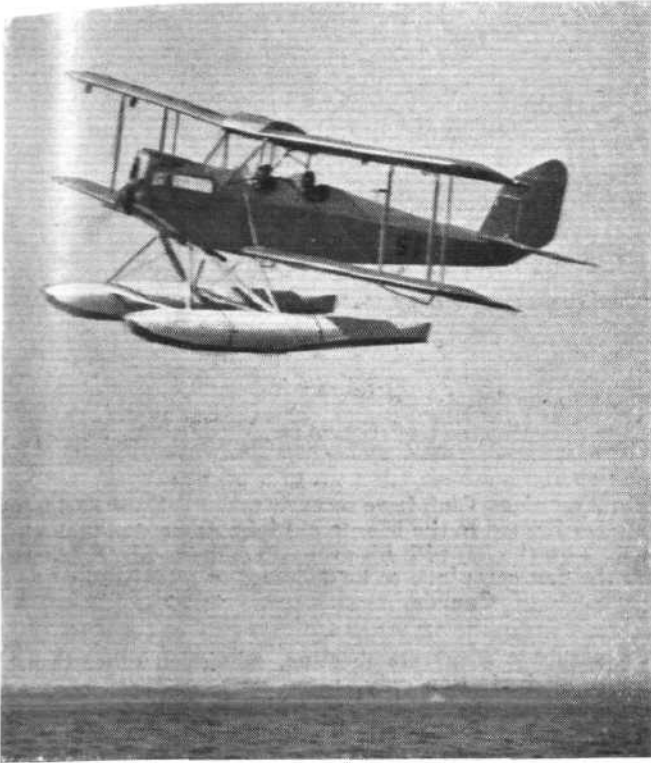


THE L.M. FLYING INSTRUCTOR: Mr. John Leeming, of Northern Air Lines, Ltd., has, together with Mr. M. Morgan, a motor engineer of the Ford Motor Co., invented this new flying instructor, which will be marketed at £25. It has proved a considerable "time-saver" in enabling pupils to get the "feel" of the controls. Enquiries should be addressed to the Air Port of Manchester, Barton Moss, Lancs.

"Allied Newspapers."



A NEW BRED A DEVELOPMENT: In our issue for June 12 last we published illustrations of a Breda "15" light plane fitted with an inverted engine, which provided greatly improved vision. Above we show another development, a Breda "15" seaplane fitted with an 105 h.p. Isotta-Fraschini Asso 80 Ri. 6-cyl. engine. This is an upright in line engine, but fitted with reduction gear which enables the engine to be placed low down in the fuselage, thus retaining the features of the upright type with the advantages of the inverted engine. The main characteristics of this machine—which has wooden wings and welded steel tube fuselage—are: span, 38 ft. 9 in.; wing area, 236.7 sq. ft.; weight empty, 1,279 lbs.; useful load, 617.4 lbs.; total weight, 1,896.4 lbs.; speed range, 43–105 m.p.h.; climb, 8,200 ft. in 21 min.; duration (cruising speed), 5 hrs. The Breda Company are delivering 100 of these seaplanes to civilian aero clubs in different parts of Italy.



The Spartan "Arrow" Seaplane (Hermes II) which has recently been supplied to the Hon. A. F. Guinness, who has disposed of his Moth (Hermes II) which was fitted with the Short Amphibian undercarriage.

those whose skins were not tough, as it is rumoured that the Club House steward was relieved of his entire stock of olive oil before all the visitors left in the evening.

The whole week-end was exceptionally enjoyable and a triumph of organisation, and we would like to congratulate the club on getting Mr. Fred Gough back again to run it for them.

A BUSINESS FLIGHT FROM CAPE TOWN.—By landing at Heston Air Park, Middlesex, on June 28, Mr. and Mrs. Humble have completed a flight from Capetown to England in 18 flying days, a distance of 10,290 miles, at an average speed of 105 m.p.h. A director of a British firm of electrical switchgear manufacturers with a branch in Capetown, Mr. Humble became impressed with the opportunities presented by flying for keeping in personal touch with customers and for transacting business generally over long distances. Both he and his wife learned to fly less than a year ago with the De Havilland Company in South Africa, from whom he purchased his Puss Moth.

The trip was a combination of business and pleasure. Leaving Capetown on June 1, two days were spent in Johannesburg, three in Nairobi and ten in Cairo, where Mr. Humble had business demanding his attention in person. From Stag Lane Aerodrome, they continued their journey on July 1 to Renfrew, landing *en route* at Sherburn.

Mr. Humble is emphatic on the advantages to the up-to-date business house of travel by fast and handy light aircraft. He had not a moment's anxiety or trouble of any kind, despite his comparatively short flying experience, and besides his business in Egypt, he was able to form a first-hand impression of the possibilities of trade for his firm in Kenya and other districts. He regards his Puss Moth primarily as a vehicle of rapid and comfortable travel in a straight line. He has nothing against the pilot who indulges in "stunt" flying, but, in his view, such exhibitions not only fail to demonstrate the real value of serious flying, but serve merely to emphasise what difficulties flying may possess.

CINQUE PORTS FLYING CLUB.—Owing to pressure of business Mr. R. Dallas Brett has been forced to resign his position as Hon. Secretary, and this has been taken over by Mr. R. J. Drake, of Hythe, to whom all communications should in future be addressed. In recognition of his services in founding the club and in being Hon. Secretary for over three years, Mr. Dallas Brett has been made an honorary life member of the club.

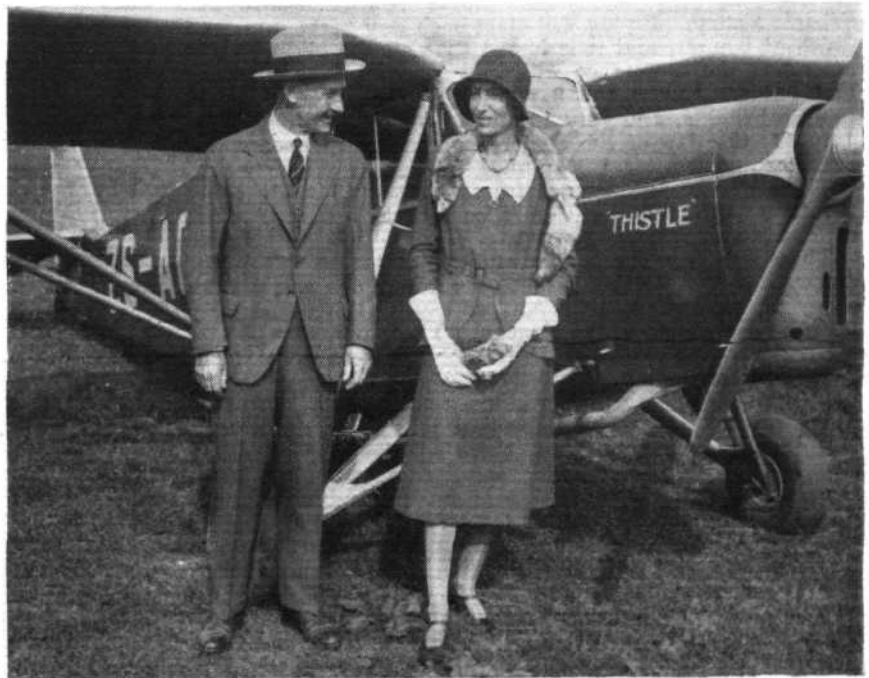
In keeping with the go-ahead policy of the club they have just produced an extremely useful little booklet, which contains not only a history of the club and information about it, but also articles on the practical side of flying from authorities. Copies will be sent by the club to applicants who mention *FLIGHT*, for the sum of 1s. post free.

The flying time for the week ending July 4 was 25 hr. 10 min. This is rather low, as unfortunately high winds and mist prevented any flying on Saturday, while heat haze has constantly handicapped instruction during the week.

LINCOLNSHIRE AERO CLUB.—An Air Pageant has been arranged at Cleethorpes on Saturday July 18, in aid of the local hospitals. A large number of trophies and prizes are offered for all competition events, and a prize will be awarded to the pilot of the machine landing nearest to the sealed arrival time, which will be between 12.15 and 12.45 p.m. There will be a race of three laps over a 11½-mile course. The handicapping will be done by Capt. Dancy and Mr. Rowarth, thereby ensuring an excellent race. Those wishing to enter should write to the Hon. Secretary, Mr. C. B. Fisher, 46, Bedford Avenue, Cleethorpes, for entry forms as early as possible.

BROOKLANDS.—Bad weather has greatly restricted flying during the past week, with the result that only 45 hr. were flown. In spite of this over three new "A" licences were obtained, and a number of night flights, which are a regular feature of the instructional curriculum, were made. Several new pupils from the East have joined the school, adding to its international character, since there are already pupils from very nearly every part of the world.

LEICESTERSHIRE AERO CLUB.—The Leicestershire Aero Club seems to have no limit to its pushfulness, and every week now they have some form of competition or event to amuse their existing members and to attract new members.



Mr. and Mrs. Humble who landed at Heston on Sunday, June 28, after having flown from Capetown in their Puss Moth (Gipsy III) in 18 flying days at an average speed of 105 m.p.h. Mr. Humble is a director of a British firm of electrical switchgear makers and has only been flying a year. He uses his aircraft for business trips and came home via Johannesburg, Nairobi and Cairo.

Last week this took the form of an aerial treasure hunt wherein the competitor had to find certain marks from written clues. Mr. Holyoake was the winner, as he only missed one clue, and Mr. R. C. Winn second, missing two.

An interesting visitor on Sunday, July 5, was the Saro Windhover, piloted by Capt. S. D. Scott. Col. Jovanovic, of the Yugoslavia Air Force, and Mr. John Lord, of Saunders-Roe, Ltd., were among the passengers.

HANWORTH — BLACKPOOL RACE.—In connection with the opening of the Blackpool Municipal Aerodrome on July 8, a race was held from Hanworth to Blackpool. There were 14 starters and 13 machines finished. Mr. Tommy Rose, in a Civilian Coupé, made a forced landing at Iver Heath. The winner of the race was Col. L. A. Strange, who was flying a Spartan three-seater (Hermes). Second was Mr. Percival on a Hendy 302 (Hermes), and Mr. L. M. J. Balfour on a Puss Moth (Gipsy III) was third.

In next week's issue of FLIGHT we hope to publish a report on the opening ceremony, etc., at Blackpool.

HOUSEHOLD BRIGADE FLYING CLUB.—On the occasion of the Household Brigade Flying Club meeting, July 22, Heston Air Park will be closed to the general public from 2 p.m. until 6 p.m.



The McGill University Light Aeroplane Club have recently taken delivery of this 1931 Moth (Gipsy II). The club is affiliated to the Montreal Light Aeroplane Club whose instructor, Capt. H. Spooner, is on the left with his ground engineer, Mr. F. Hopkins, on the right. This Moth is the first aeroplane to be delivered to a University Club in Canada.

As this is a private meeting, admission other than by air is by invitation only.

During the flying display, which is from 4-6 p.m., the Aerodrome will be closed except for the purpose of Customs. Machines taking part in the Display and visiting aircraft are asked to arrive before 3.15 p.m.

The general public enclosure, which has recently been opened by Airwork, Ltd., will be opened as usual, admission price 6d.



THE AIRCRAFT CLUB, HARROGATE.—In order that the Conference of gliding clubs being held at Ilkley on July 11 may also take on a practical character, the Aircraft Club have obtained the use of Beamsley Beacon, which towers 900 ft. above the Wharfe Valley. Flying will start each day at 11 a.m. and finish at 9 p.m., and it is hoped that all the gliding clubs attending the conference will send some of their machines and pilots. July 8 and 9 will be set aside for trial and practical flights, and July 10 and 11 for competitions. On July 11, the day of the conference, important events will not start until after 1.30 p.m.

There will be an entrance fee on each machine to cover the four days, and this should be sent to Mr. R. A. Bell at 7, Station Parade, Harrogate.

There will be a car park near Dearstones, on the Bolton Abbey-Harrogate Road, whence spectators can easily walk across to the landing field, and so avoid taking their cars up the rough road to the Beacon. There will also be two car parks on the road from Beamsley village to the Beacon.

The Aircraft Club would greatly appreciate voluntary help from members of other clubs, as there is a large area to be covered and many important jobs to be done.

Amongst the competitions, there will be a spot landing competition for gliders and a speed competition for more advanced machines, consisting of an out-and-home flight round a turning point. After tea on Saturday the meeting will terminate with a competition for the greatest distance flown in the direction of Malham. This will be divided into two classes, one for gliders and one for sailplanes.

TOWED FLIGHT AT THE WASSERKUPPE.—The Flying School of the R.R.G. have made arrangements for a course of instruction in towed flight to be held at the Griesheim flying ground, near Darmstadt, from September 1-6. Only pilots who are in possession of gliding certificates "C" and other experienced gliding pilots known to the Director will be admitted to the course. Fees for the course are M.150 for German sub-

jects, M.100 for members of the German Aeronautical Associations and groups, and M.300 for foreigners. Application for the course should be sent to the Fliegerschule des Forschungs-Institut der R.R.G. Wasserkuppe, Post Gersfeld (Rhön), not later than August 10.

SOUTHERN COUNTIES SOARING CLUB.—This is an amalgamation of the Southern Soarers' Club and the Surrey Club. The President will be the Duke of Sutherland, and the Chairman Mr. R. F. Dagnall.

Mr. A. Yorke Bramble is the Hon. Secretary, while the club will have its headquarters at New Yorke Hotel, Bedford Square, Brighton (telephone, Hove 5116), with social club premises at 4, Montpelier Road, Brighton.

Normal work of the club will be divided into two sections, the training section working with primary machines in the High Barn area of the site, and the practical section working with intermediate machines in the New Market area of the site. Flying will be carried out on Friday evenings, Saturday afternoons, and all day Sundays.

Details of a modified system of towed launching will be published shortly for the benefit of other clubs. This is said to be foolproof, and enables a very small group to operate it satisfactorily.

TAUNTON GLIDING CLUB.—At a meeting held at Taunton recently it was unanimously decided to form a Gliding Club for the district, and a membership of 20 was enrolled then and there. The following officers were also appointed:—Hon. Secretary, Mr. S. H. Mattocks; Hon. Treasurer, Mr. W. M. James; Technical Adviser, Mr. H. Birchall; Committee, Mrs. A. Hamilton Gault, Miss D. Newcombe, Messrs. L. C. Barker, M. R. Mattocks, S. Ward, G. T. Eveleigh, and F. A. Pine (Bridgwater). Mr. H. T. Kite is to be invited to act as Hon. Solicitor. It was suggested that the subscription should be two guineas per annum. A further meeting will be held in the near future.

AIR TRANSPORT

The progress of aviation in the East is always an important subject, and our Contributor, who has recently returned from China, gives below some interesting views on the position of aviation in that country. There is little doubt that there are great possibilities regarding the development of aeronautics in that part of the world—especially in so far as the British aviation industry is concerned if it will only take the initiative.

CHINA presents a most wonderful field for aviation, comparable as it is with Russia topographically, but with a kinder climate. It is a pity that this field is not being more rapidly developed. There are many reasons put forward, not the least of which are the interference by ignorant or inexperienced officials and the inter-departmental and inter-district blocking tactics prevalent in a country which is very much divided within itself.

Airway companies have started under various names and leaders, but neither the one nor the other appear to have lasted very long. The same appears to be the case with the Government Aviation Department. Truly an ever-changing Oriental kaleidoscope. Aviation is far too noble and powerful an instrument of national development to be debased to personal ends, which appears to be the case in Central and South China, and both her equipment and personnel are being adversely affected by the Government's present tactics.

The so-called bandit menace in China has been very effectively handled in some cases where aeroplanes were used, which seems the obvious method to pursue in a country possessing poor lines of communication. But there again the operations have been undertaken so half-heartedly that a lasting effect has seldom or ever been produced.

Very few experienced foreigners are being employed by the Chinese, most of the instructors being Chinese, who in the main have had an indifferent training in American aviation schools. It is the practice in training Service pilots to concentrate on forced landings, cloud flying, aerobatics, formation flying, etc. This is not apparently encouraged by the Chinese aviation officials, and during the whole period of my stay in Nanking I saw nothing more than a steep turn attempted. Chinese pilots do not appear to take readily to "stunts." The Chinese Government will not engage experienced foreign pilots, and is unfortunate in having practically no "old hands" in aviation to guide her air policy, with the result that she is building up a semi-experienced and semi-trained Aviation Corps. Although the tendency in most countries is to reserve flying for the young men, it is still an accepted fact that a leavening of older experienced men is essential,

for no matter how good a young pilot may be it is impossible for him during his short experience to have faced and overcome the emergencies that have fallen to the lot of men who count their flying hours in four figures and whose advice can be invaluable to them in showing what to do and what not to do under certain circumstances. This does not appear to appeal to the Central Government's aviation advisers.

The Chinese pilots training at Canton and Nanking usually consists of a preliminary course on a Moth or light German machine and then an advanced course on an American Vought Cosair or similar type of aircraft. If he does satisfactorily he will probably be sent to drop some "pills" on anti-government troops or "bandits." Truly, in flying, is a little knowledge a most dangerous thing. It has been said, and possibly with a certain amount of truth, that the Aviation Corps' list of casualties is small, but I venture to suggest that it is more than in proportion to the risks taken.

Civil aviation in China is represented by two airways: The China Airways operating between Shanghai and Hankow, which is run jointly by Chinese and the American Curtiss interests and under direct Government control, and the new Euro-Asia Line to Berlin, under joint Chinese and Luft-Hansa management. The China Airways has had a very creditable performance during its period of operation, some fifteen months, doing some 350,000 miles during that time with one fatal accident, caused through a wing of the Loening Amphibian striking the mast of a junk on the Whangpoo River. The finding of the court of inquiry was to the effect that the pilot was at fault, which would appear to be a satisfactory verdict from the point of view of the court, the pilot having been killed. It is known that a Chinese official was carrying excess luggage, that the hull was partially waterlogged and that the best part of a mile was required for the "take off." These Loening Amphibians are at least two years old, and during that period have not had an inspection such as is required by the Civil Aviation Department of most European countries and the U.S. The pilots of the China Airways are all American Transport pilots with Chinese 2nd pilots. The American pilots do not consider the Chinese pilots reliable or likely to prove efficient. The fact that the latter have had no preliminary training in light machines would undoubtedly be a handicap. The Euro-Asia Line is employing German pilots. The only British pilots are those employed by British companies with selling agencies. The Germans are undoubtedly strengthening their position in Chinese aviation, and possibly are especially favoured, since the vexed question of extraterritoriality does not concern them.

British manufacturers would be well-advised to make firm contracts with the Nanking Government, offering no loophole, always provided their pilots can obtain permis-



FOR IMPERIAL AIRWAYS: The second of the Avro 10 three-engined (Armstrong-Siddeley "Lynx") commercial monoplanes which have been supplied to Imperial Airways Ltd.

sion to make a proper demonstration unhindered by various departmental "verboten," and make a sale.

Unfortunately, it was not my good fortune to go up North, where the "Young Marshal," as Chang Hsueh Liang is affectionately called, has, I have learnt through a thoroughly reliable source of information, formed a very up-to-date Air Force, and is a very different stamp of man from the Southerner. He is progressive and always willing to consider improvements and innovations, and is a real power in his country. An ex-R.F.C. friend of mine is a personal friend of the "Young Marshal," and speaks admiringly of him as a man of his word and one who gets things done. Chang Hsueh Liang has been unjustly described by some writers as an easy-going pleasure-seeker.

Civil Aviation in Poland

In the report on the Economic Conditions in Poland, issued by the Department of Overseas Trade, the following reference is made regarding aviation in that country:—

"There was a further expansion of air traffic during the year 1930; the kilometrage flown increased from 1,384,723 to 1,401,167, but the number of passengers carried fell from 14,628 to 12,315. 1930 has added another year to the favourable record held by Polish civil aviation; there were no fatal accidents and only a small number of forced landings. Aerial communication between Warsaw and Bucharest was established in June and has become a popular means of travel. It is now proposed to establish a service between Warsaw and Salonica, and Warsaw and Tallinn, in Estonia, via Wilno and Riga, but no progress was made in the negotiations for the Warsaw-Berlin and Warsaw-Moscow services. The absence of the former is a handicap to British trade, and it is therefore to be hoped that it will soon come into existence."

The "Lot" Company runs air services from Warsaw to the following towns (the time taken for the journey being given in brackets):—Danzig (2½ hr.); Bydgoszcz (2 hr.); Poznan (2 hr.); Katowice (2 hr.); Krakow, via Katowice (3 hr.); Lwow (2½ hr.).

Air Mail to China

THE Postmaster-General announces that a new air mail service to China is now available for all classes of postal packets, except parcels and small packets. Packets may be registered but not insured. The correspondence will be conveyed by air between London and Irkutsk and between Manchouli and Shanghai, the journey between Irkutsk and Manchouli being covered by train. The service offers a gain varying from 4 to 8 days to Shanghai as compared

This is not the case; he is a strong man with ideas, and his outwardly easy-going good nature is merely a cloak for an exceedingly determined character. The story of how some years ago he handled the malcontents of the North, if ever told, would make an interesting historical romance. In more than one case he was his own executioner. At present, Chang Hsueh Liang has thrown in his lot with Chian Kai Shek, for, to his father's sorrow, he always had leanings toward republicanism; but if he should decide to split with the Nanking Government and resort to arms it is safe to predict that the North would probably win, for he is not eternally making the peace between departments, and he will undoubtedly sweep the Southerners from the air.

"CABANE."

with the normal time of transit by the ordinary route via Siberia. The combined postage and air fee is 1s. 8d. per half ounce and the latest time of posting in the special air mail letter box outside the G.P.O., London, is 10.30 a.m. on weekdays and correspondingly earlier elsewhere.

Civil Aviation in India

Mr. F. TYMMS, the Director of Civil Aviation in India, and Mr. J. A. Shillidy, Secretary of the Industries and Labour Department, which controls civil aviation, were examined at Simla, on July 2, by the General Purposes Retrenchment Committee on questions affecting civil aviation, and especially the proposals for an Indian State air service. Sir George Schuster, Financial Member of the Indian Government, was present at the proceedings, which were private.

The African Air Mail

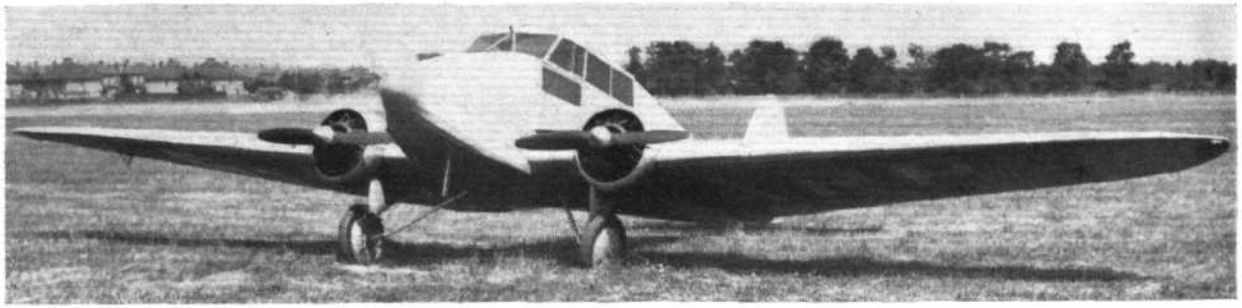
ACCORDING to the Nairobi correspondent of *The Times*, an important addition is to be made to the air mail services this week. By arrangement with the Post Office, a Wilson Airways machine will take the mails from Nairobi to Kisumu every Wednesday to connect with the Imperial Airways line. Before, inward mails arrived on Monday and outward closed the same afternoon, which made it impossible for business firms to reply to correspondence. The new local service is to be maintained for three months.

South African Air Services

A HIGH official of the South African Railways is reported to have stated that, if the plan for a Johannesburg-Durban privately-owned air service took definite shape, the Railway Administration would have no alternative to introducing a competitive Departmental service worked in conjunction with railway facilities.



THE SARO PERCIVAL MONOPLANE: The Saro Percival Monoplane is the first 3-engined long-range mail plane to be built in this country, and from the preliminary tests it would appear that it will fulfil this duty in a remarkably efficient manner. The engines are three Gipsy III's and, as can be seen from the photograph, are very neatly cowed in. The landing run is very short indeed, while the landing speed, although figures may not yet be quoted, is also very low. This fact, together with the immunity from forced landings which the three-engine arrangement will give, should make the Saro Percival an ideal night mail carrier; a type which will be found invaluable in many parts of the world.



AN INTERESTING EXPERIMENT

The little twin-engined light plane designed by the Mono-Spar Company, and built for them by the Gloster Aircraft Co., Ltd., has now been through its tests at Martlesham Heath. The machine was built to test out Mr. Stieger's monospar type of construction in actual flight, and the results have, generally speaking, confirmed Mr. Stieger's theories. The machine is described below. The actual production type will differ in certain details, but not in the general principle of the type of structure used. The experimental machine is a two-seater. The production model will be a four-seater.

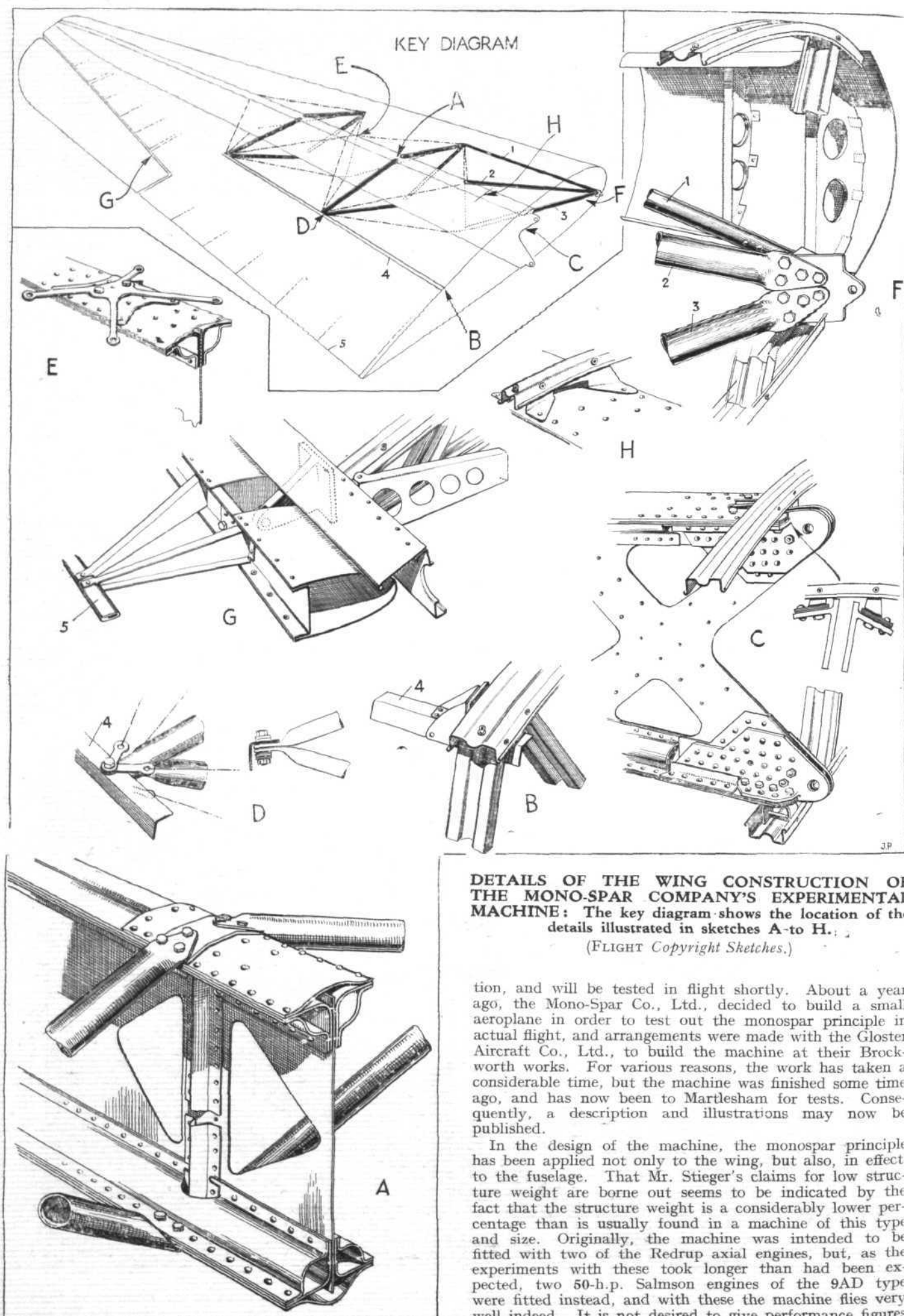
UNIFORMITY of stress in the various parts of an aircraft structure is not readily attained. Mr. H. J. Pollard has pointed out, in his series of articles in *THE AIRCRAFT ENGINEER* (Monthly Technical Supplement to *FLIGHT*), that in the conventional biplane structure changes of loading occur which cannot, for manufacturing reasons, be followed by corresponding changes in the strength of the structure members. In a monoplane structure, and more particularly, perhaps, in a cantilever monoplane, the chances of proportioning the structure to the stresses throughout are a little better, but the cantilever monoplane is usually heavier than the biplane in spite of this, due to the smaller depth of struc-

ture. This applies particularly to the two-spar type of structure. Mr. Pollard has been working for some years on multi-spar wings, and some very interesting developments are likely at Filton.

In the meantime, Mr. H. J. Stieger, a young Swiss engineer, has conceived the idea of using a single spar, so built as to be strong enough to take all the bending and shear stresses, but braced in a special manner against torsional loads. It may be recollected that at the Olympia Aero Show a section of a wing built on this principle was exhibited. Since then work has been proceeding, and, as recorded in *FLIGHT* recently, a monospar wing for a three-engined Fokker monoplane is now nearing comple-



THE MONO-SPAR COMPANY'S EXPERIMENTAL MACHINE: These two views of the machine in flight show the excellent visibility from the cabin, and the pronounced taper of the wing. The engines are 50 h.p. Salmsons. (*FLIGHT* Photos.)



DETAILS OF THE WING CONSTRUCTION OF THE MONO-SPAR COMPANY'S EXPERIMENTAL MACHINE: The key diagram shows the location of the details illustrated in sketches A-to H.
(FLIGHT Copyright Sketches.)

tion, and will be tested in flight shortly. About a year ago, the Mono-Spar Co., Ltd., decided to build a small aeroplane in order to test out the monospar principle in actual flight, and arrangements were made with the Gloster Aircraft Co., Ltd., to build the machine at their Brockworth works. For various reasons, the work has taken a considerable time, but the machine was finished some time ago, and has now been to Martlesham for tests. Consequently, a description and illustrations may now be published.

In the design of the machine, the monospar principle has been applied not only to the wing, but also, in effect, to the fuselage. That Mr. Stieger's claims for low structure weight are borne out seems to be indicated by the fact that the structure weight is a considerably lower percentage than is usually found in a machine of this type and size. Originally, the machine was intended to be fitted with two of the Redrup axial engines, but, as the experiments with these took longer than had been expected, two 50-h.p. Salmson engines of the 9AD type were fitted instead, and with these the machine flies very well indeed. It is not desired to give performance figures

at present, as the machine will not go into production in its present form.

The experimental machine is a three-seater, with pilot and one passenger side by side, but slightly staggered, and a third seat behind them. Owing to the forward position of the pilot's seat and the absence of an engine in the nose of the fuselage, the view forward is exceptionally good. Large windows in the cabin give a good view outwards, although from the back seat the view is, as in most low-wing monoplanes, slightly interfered with.

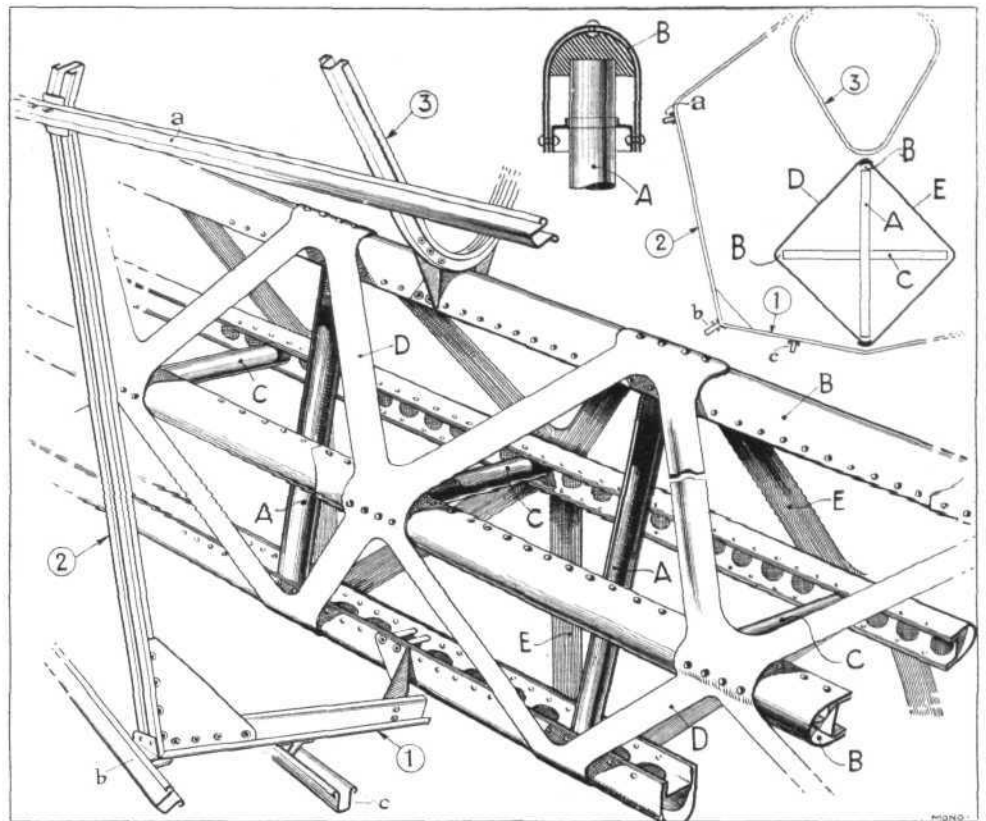
The two Salmson engines are mounted on the wing, and direct gravity feed is provided by carrying the petrol in a tank in the fuselage nose, in front of the instrument board.

The wheels are provided with brakes, and a tail wheel is fitted in place of a tail skid. An experimental arrangement for coupling the brakes to the control column has been incorporated, so that, when the pilot pulls the stick back for a three-point landing, the brakes are operated. The interconnection can, however, be released when the brakes are operated by a centrally-placed lever in the orthodox manner.

As the machine under review is purely experimental, it is not thought necessary here to deal very much with its general features as an aircraft, which may be somewhat altered in the model to be placed on the market as soon as production gets going at the premises which have been temporarily acquired at Croydon aerodrome. It is, however, worth placing on record the fact that in the production of the experimental machine a considerable amount of wind tunnel work on thick wing roots has been done, and that, as a result, the difficulties of thick wing roots behind wing engines placed close to the fuselage have been overcome, and methods have been found for keeping the airflow smooth and retaining the controllability down to large angles of incidence.

Structural Features

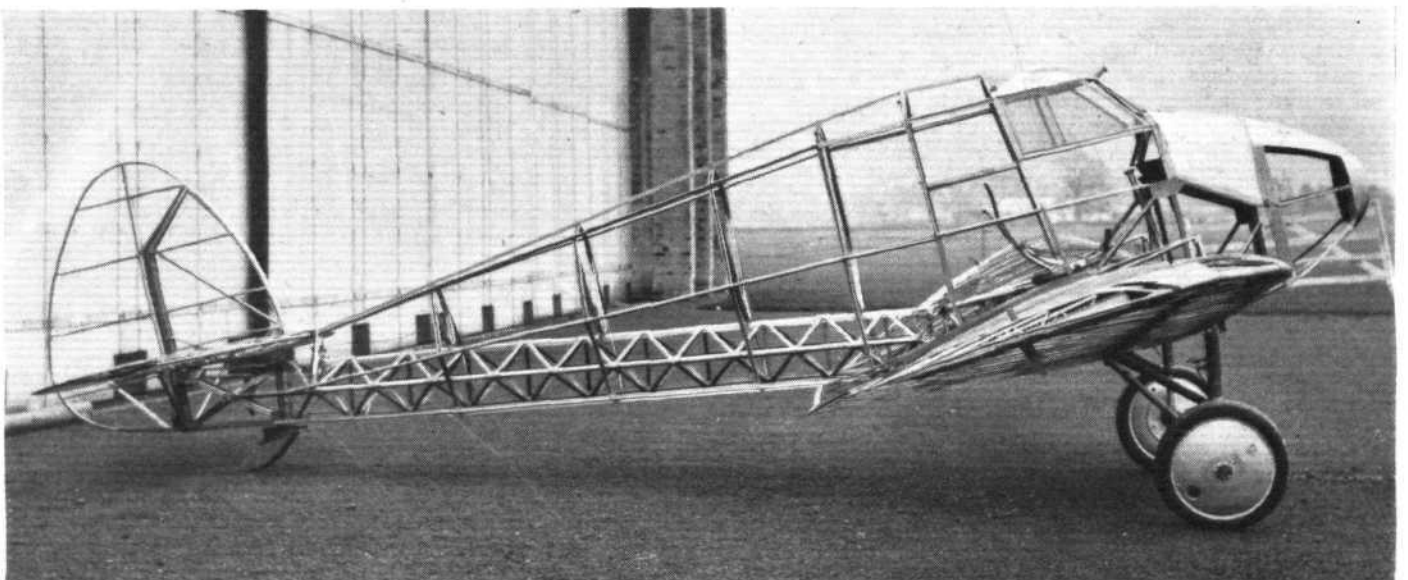
The main reason for producing the monospar machine was, as already stated, to try out in flight the Stieger



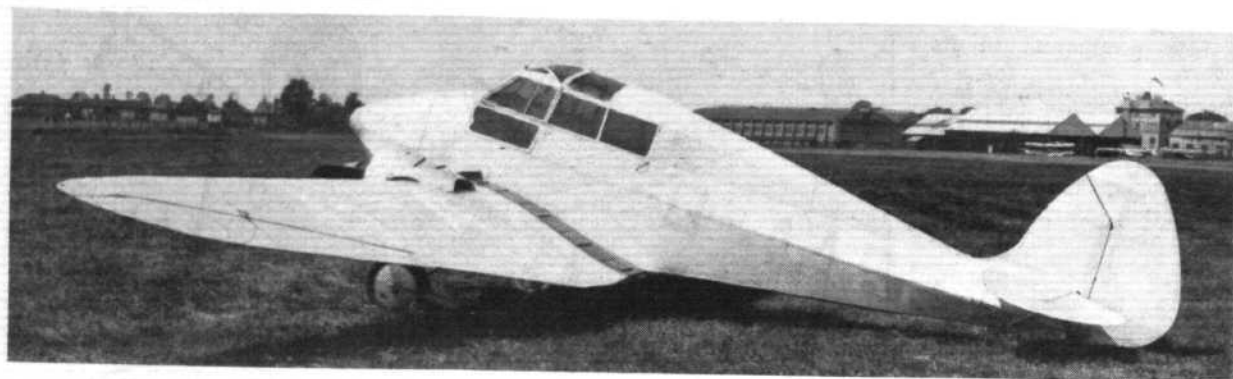
THE FUSELAGE BOOM: Details of the construction. The corner strips and surrounding bracing are of Duralumin. The depth of the boom is approximately one foot, and it is placed in the bottom of the fuselage, the outer form of which is produced by hoops and stringers.

system of single-spar construction, and, as this will be retained in the production model, although with minor modifications, some notes on it here may be of interest.

It will probably be recollected from previous references to the Stieger monospar system that this consists of a single main spar, strong in bending, but braced against torsion by what may best be described as "spiral" bracing wires, these wires consisting of two sets, which may be imagined as running around the wing in opposite directions. Under the Mono-Spar Company's patents, the single spar may, of course, be of any suitable construction. In the machine with which we deal here, it is an I-beam of duralumin, built up of several members. The web itself is a plain duralumin plate, with triangular holes stamped out for lightness, leaving a series of lattice bars to act as braces between top and bottom flanges.



IN SKELETON: The Mono-Spar Company's Experimental Machine before it was covered. The shallow depth girder which forms the main fuselage member is clearly seen.



NEW LINES: The general conception of the machine is unorthodox, apart from the construction, and good view from the cabin has been one of the considerations. The registration letters have photographed somewhat indistinctly. They are G-AARP. (FLIGHT Photo.)

The spar flanges or booms are built up of strips, and may be said to consist of angle sections riveted to the web, with reinforcing cover plates added on the outside. The angle-sections are not, however, of the usual plain flat type, but are of curved shape, as shown in the sketch A on p. 668. A flange of this shape should be a good deal stronger in compression than one consisting of plain flat angle sections, as the members composing it help to brace each other. At the same time, the spar should not be an expensive one to manufacture, and, where local reinforcement is necessary, this can be provided by extra laminations on the outer faces of the spar. The spar web being, as already stated, perfectly flat, is stiffened here and there by vertical members of V-section, also shown in sketch A.

The "spiral" bracing of the wing takes the form of tie rods anchored at their ends to the apices of tubular king post ribs, and to plate fittings on the spar flanges, where the tie rods of a bay cross each other. This "spiral" bracing does not extend right out to the wing tips, but finishes on the spar just beyond the inner end of the aileron. From this point to the wing tip the bracing is taken over by the false spar carrying the aileron. This spar is placed at a pronounced angle with the main spar, which it meets at the wing tip, thus triangulating the structure.

The wing is in three pieces, of which the centre portion is built integral with the fuselage, and contains the engine mountings. The two outer wing portions are attached by three bolts each, two on the spar flanges and one on the forward king post. In the centre section the struts supporting the engine bearers are used as the king posts in the wing bracing system.

Wing ribs of orthodox type are employed, and resemble those used on "Gloster" machines for several years, with the fabric wired on to the ribs in the "Gloster" manner.

As already mentioned, the monospar system of construction has been applied to the fuselage also, although naturally in a modified form. The main structure member of the fuselage is a beam of relatively shallow depth, and reminds one, in principle if not in actual form, of the steel tube used in early Breguet machines. In the monospar machine, however, this beam is an open girder of duralumin, of square section, and "standing on a

corner." The four corner booms of this beam are of built-up D-section, and are joined by an outer cover of duralumin sheet, stamped out to form lattices like the main wing spar web. This cover braces the fuselage beam, and consists in two halves, the free edges of which overlap on the top and bottom booms. This form of construction appears needlessly expensive, and one would have thought that a number of standardised short lattice bars would have been much cheaper to manufacture.

A hollow square-section tube like that just described would collapse inward under low load, and to prevent this the four booms are kept apart by tubular distance pieces running from corner boom to corner boom, vertical distance pieces alternating with horizontal ones.

The fuselage beam is placed at the bottom of the fuselage, and is anchored to the wing spar of the centre-section by a large tubular vee. The attachment is considerably complicated by the fact that the fuselage boom is "standing on a corner." Had it been lying flat on one of its sides, the attachment could have been made to the spar direct, much as is that in the Breguet "Tout Acier."

The fuselage shape proper is obtained by hoops of trough-section duralumin and fore- and aft-stringers of similar section. In the side view of the machine in skeleton no wiring is shown, but actually a certain amount of "spiral" wiring was added to the fuselage after the first test flight to get greater torsional strength. This wiring had the desired result, and the machine is now, we understand, thoroughly rigid and free from torsional and flutter troubles of any kind.

The slipstream from the two propellers, running as they do close to the fuselage and wing roots, caused a certain amount of trouble at first, but the designers have now succeeded in finding means for smoothing out the airflow, and the machine is reported to be remarkably pleasant to fly. In landing, it shows no tendency to "kite," but sits down without any trouble at all.

As previously mentioned, the Mono-Spar Company has secured temporary accommodation at Croydon, and here the work of building the production type will be begun. Later it is possible that a move will be made to another aerodrome in South London.

"Fireflies" for Belgium (see page 672)

JUST as we are about to go to press with this week's issue of FLIGHT, news comes through that the first batch of Fairey "Fireflies" (Rolls-Royce Kestrel) have passed their acceptance tests before representatives of the Belgian Air Force. In speed as well as climb the contract performance was exceeded, and the machines were finished to the contract date. This means that they have been completed in seven months. It was actually found that the production machines were lighter than the experimental type. The speed recorded and officially recognised, after due corrections, was the astoundingly high one of 358 km./h. (223 m.p.h.). The Belgian Air Force looks like being the envy of the world.

Mr. Shackleton Established

SOME weeks ago we announced that Mr. W. S. Shackleton, the designer of the A.N.E.C. monoplanes, the

Beardmore "Wee Bee," and other machines, was returning to this country from Australia in order to start in business as a consultant, more particularly in connection with advice on flying equipment for Australia, New Zealand and New Guinea. Mr. Shackleton has as his partner Mr. Lee Murray, who is now on his way home, flying his Desoutter monoplane through America and Canada. Shackleton and Murray have taken offices at 175, Piccadilly, where those wishing to get in touch with them should apply.

Merthyr Aviation Society

WE have received a book of ballot tickets emanating from a society calling itself the Merthyr Aviation Society, in which it is announced that the results of the competition will be published in FLIGHT. We take this opportunity of informing our readers that we are in no way connected with this ballot, have not been consulted about it, and have no information about it at all.—[ED.]

AIRISMS FROM THE FOUR WINDS

The Round the World Flight

As indicated last week, Mr. Wiley Post and Mr. Harold Gatty have succeeded in flying round the world from New York and back in nine days—thus beating the previous record, established by the airship *Graf Zeppelin*, and making Mr. Puck feel a trifle uneasy. Leaving Edmonton, Alberta, early on July 1, they completed the final stage, 2,000 miles, of their journey to New York, flying via Cleveland, where they halted for half an hour to refuel. They landed at Roosevelt Field at 8.49 p.m., whence they had set out on their venture on June 23 in their Lockheed "Vega" monoplane. As might be expected, the welcome accorded them was of the wildest, the crowd overwhelming the police and mobbing the two pilots. The total distance flown was over 16,000 miles, and the time for the flight was 8 days 15 hours 51 minutes, the actual flying time being 4 days 8 minutes; their average speed was 148.6 m.p.h.

President Hoover telegraphed the following message to the flyers. "America is proud of you in the hour of your extraordinary success. I congratulate you most heartily and look forward with pleasure to seeing you at the White House. The flight demonstrates vividly how modern science is making neighbours of all nations in the world."

Mayor Walker, of New York, at the official reception, said:—"When your ship left Roosevelt Field it was the *Winnie Mae*. I have an idea that over Russia and the Far North you decided it was the *Winnie Must*. And last night, back at Roosevelt Field, it became the *Winnie Did*."

On July 6 the two airmen were entertained to luncheon at the White House by President Hoover, a distinguished gathering being present.

Lord Amulree, Secretary of State for Air, has telegraphed the following message to Mr. Wiley Post and Mr. Harold Gatty on the successful completion of their flight round the world: "On behalf of Air Council, I send hearty congratulations on your magnificent flight."

The Flight to India

BAD luck has not yet deserted Capt. Neville Stack and Mr. Chaplin, who for some time past have been anxious to establish a record flight from England to India and back in their Vickers-Napier biplane. As reported last week, they left Lympne on June 29 on an attempt to fly to India and back in six days, and succeeded in reaching Baghdad on July 1. Here, however, radiator trouble developed, and it was decided to abandon the attempt. On July 4 they flew 1,100 miles to Constantinople, and hoped to complete the journey to Croydon non-stop next day. Owing to bad weather conditions, however, they had to land at Regensburg, Bavaria, and did not get back to Croydon until July 6.

A West-East Australia-England Bid

MR. F. C. CHICHESTER has embarked on another World Flight. This time it is a flight from Australia to England via New Guinea, Japan, Alaska, Canada, Greenland, and Iceland; he is flying in a Moth seaplane. Carrying a message from the Prime Ministers of Australia and New Zealand to the Japanese Prime Minister, he took off from Sydney on July 3, reaching Brisbane. He arrived at Thursday Island on July 6.

Graf Zeppelin

The German airship *Graf Zeppelin* returned to Friedrichshafen on July 3 after a 4,500 miles cruise of 72 hours over England to Iceland and back. In consequence of a message which Dr. Eckener, the commander of the *Graf Zeppelin*, has received from Sir Hubert Wilkins, stating that the submarine *Nautilus* is now almost repaired, the scheme of a flight in the airship to the Pole, which had been abandoned, is being reconsidered. At the moment it is uncertain whether the airship will make an Arctic voyage in conjunction with the Russian icebreaker *Malygin* or attempt a flight to meet Sir Hubert Wilkins at the Pole, or combine these alternatives. *Apropos* the *Malygin* expedition, it is of interest to note that Professor Vizee, its leader, hopes to reach Rudolph Island, where, he says, there is a slight chance that Captain Amundsen, given up as dead, may be living. Amundsen was lost in 1928 while flying to the rescue of the members of the airship *Italia*. Before she starts on her Arctic trip the *Graf Zeppelin* will visit London, for Colonel the Master of Sempill, on behalf of the London Air Park, Hanworth, has hired the airship to take members of the club on a flight round Great Britain on or about July 16. The *Graf Zeppelin* will leave Friedrichshafen in time to arrive at Hanworth at about 8 a.m. She will bring about 30 German passengers, who will see the sights of London during the 24 hours in which the airship will be making the trip with English passengers.

The Race Round the World

MR. SUTEMARU SHINGU, one of the two Japanese journalists who, as reported last week, are flying round the world in opposite directions using the regular passenger air services, has met with an accident. The aeroplane in which he was travelling made a forced landing soon after leaving Moscow eastwards. Mr. Shingu had to return to Moscow, and left by the trans-Siberian train yesterday. His injuries are believed to be slight.

And a French Attempt?

An attempt to beat the record just set up by Post and Gatty in flying round the world in nine days is to be made by the French aviators Le Brix and Doret. They originally intended to start from Le Bourget on July 3, but they postponed their departure owing to atmospheric conditions.

A Fast Indian Flight

PROBABLY the fastest flight by light aeroplane in India has been accomplished by Flying Officer Mason, who flew from Bangalore to Madras (200 miles) in 80 minutes.



FOR AERO-PHILATELISTS: The collecting of air mail covers is becoming more and more popular, and a welcome innovation has just been introduced by Francis J. Field, Ltd., of Sutton Coldfield, for Collectors. It is in the form of "De Luxe" flown covers, which are mounted on a folder, the upper half of which contains title, map of the particular air service, and a concise "write-up"—first flight, dates, etc. One of these, the England-Australia service, is shown in our illustration. A number of these "De Luxe" covers have already been issued (the folders are not sold separately), and further particulars may be obtained from Francis J. Field, Ltd. (Flight Photo.)

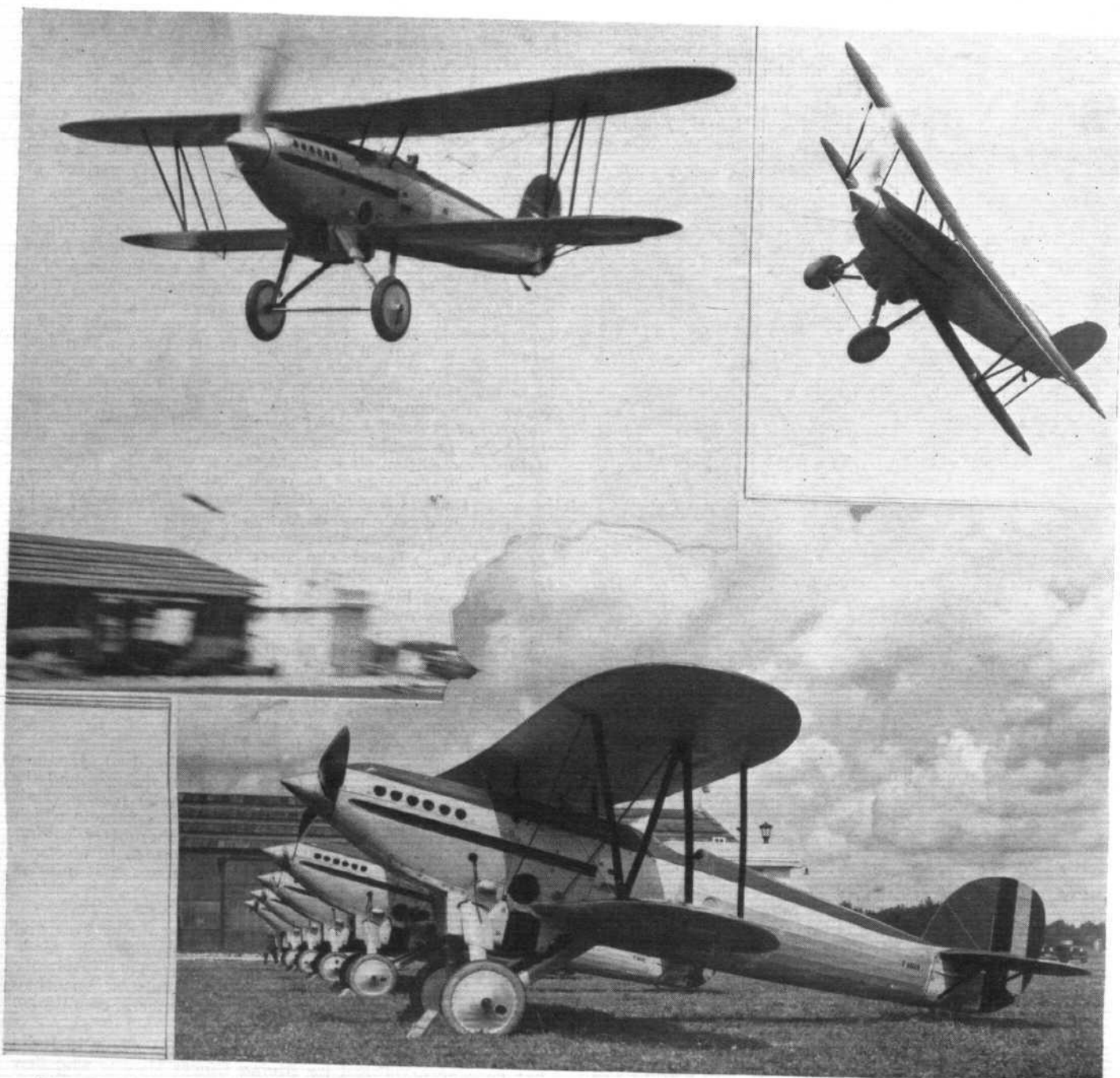
"FIREFLIES" FOR BELGIUM

THE first batch of "Firefly" interceptors (Rolls - Royce "Kestrel" engines) for the Belgian Air Force has now been completed at the Fairey works at Hayes, and are going through their acceptance tests in the presence of Belgian representatives.

The lower photographs on this page show a line of "Fireflies" and two views of a machine in flight, piloted by Mr. Staniland.

In the group on the right are representatives of the Belgian authorities and of the Fairey Company. They are, from left to right, Mr. Staniland, Major Harnould, Major T. M. Barlow, Squadron-Leader Maurice Wright, Mr. Lobelle, Adjutant Caryn, Mr. A. G. Hazell, Adjutant Kariger, Adjutant Verboomien and Mr. Ernest Tips, manager of the Fairey works at Gosselies, Belgium.

(See p. 670 for further details.)



AIRPORT NEWS

AL MOST interesting little aircraft arrived here on Tuesday in the shape of the "Arrow Active." This is the first visit of this little machine. It is fitted with a Hermes engine and is entered in the King's Cup.

On Wednesday Herr Kronfeld appeared over the aerodrome in his glider, and for half an hour or so gave us a most delightful exhibition of gliding as it should be done. He is certainly a past master at the art.

The dust problem here seems worse than ever; it is a wonder everyone is not in hospital with congested lungs. I do think that pilots might have a little more consideration than to open full out from the departure area. They could at least help matters to a great extent if they would taxi gently on to the grass before opening up full. Unless anyone has had the experience of these dust storms they can have no conception what a nuisance it is.

A nasty accident occurred in the early hours of Thursday morning, when two labourers of Imperial Airways were filling barrels with used oil from the engines. Working in the dark, one had the thoughtlessness to strike a match to find the bung hole. They are now in hospital suffering from shock and burns, but luckily for them not very serious. It passes comprehension how people can do such things when they should know better.

Deutsche Luft Hansa are now operating their G.31's and the G.38 on the Berlin—London service regularly, and are getting full loads on each trip. These large machines are the ones that appeal to the travelling public to-day, as they always express their preference for them.

Personal Flying Services' Junkers had an argument with a boundary-marking light on Friday. It is rather a knotty problem to work out who got the best of the argument, as the boundary light was laid flat and the Junker had a part of its leading edge ripped open.

Madame Ida Rubenstein, the very famous singer and dancer, arrived on Friday evening, and was welcomed by many friends.

An Aerodrome for Southend?

THE Mayor of Southend has given his support to a project to provide the town with an aerodrome.

Sheffield Municipal Aerodrome

At a recent meeting of the Standing Committee of the four associated voluntary hospitals of Sheffield it was resolved that the boards of the hospitals were anxious not to stand in the way of industrial progress of the city; that they did not consider there was any possibility of further hospital development at Norton for a considerable number of years, but they saw no reason to modify their previously expressed opinion that an aerodrome at Coal Aston under existing flying conditions would prohibit the erection of a large general hospital at Norton. The Sheffield Hospitals' Council resolved that, while not in any way objecting to the establishment of an aerodrome for the City of Sheffield, they were of opinion that the establishment of an aerodrome at Norton would make the present hospital site, upon which £35,000 has already been spent, valueless and unsuitable for its purpose, and representatives at the Joint Conference should oppose the establishment of an aerodrome at Coal Aston, upon which the Commercial Aviation Committee of the Sheffield Chamber of Commerce passed a resolution welcoming the statement by the hospital authorities that there was no possibility of establishing a general hospital at Norton for a considerable number of years, and that the hospital boards were anxious not to stand in the way of the industrial progress of the city. The Chamber appreciated the view that a large general hospital could not be situated, under existing flying conditions, in the immediate neighbourhood of an aerodrome, but in view of the long period which must necessarily elapse before any hospital developments at Norton could take place, and with the certainty that great improvements in the silencing of machines would be made in the not too distant future, the Chamber recommended that the Coal Aston site be opened immediately as an aerodrome for an initial period of five years. The Chamber also recommended that a Joint Committee of representatives of the City Council, Chamber of Commerce and Junior Chamber of Commerce be appointed to consider the best

Friday night was to have been exceptionally busy, as six or seven "A" licence pilots arrived to do their night tests for "B" licence. Unfortunately, the weather turned decidedly sticky. One pilot, Miss Gower, started off for Penshurst, but finished up at Hornchurch after a decidedly good show. Her landing was normal. Another pilot, Mr. Orme, was not so lucky. He left for Penshurst but finished near Eltham, hitting a tree in trying to land. He was slightly hurt. It was some hours, I understand, before either of these machines could be traced. In the meantime a veritable bombardment was proceeding at Croydon, which awakened all Wallington and Purley residents, whose wraths waxed exceedingly on Saturday morning.

A new company has taken up quarters here and will be known as General Aircraft Co., Ltd. Their first machine, a Monospar, has arrived. Mr. Schofield, late of N.F.S., is chief pilot. I hope to be able to give more full details in a later issue.

In regard to Imperial Airways' regular advertised services, these appear to be suffering in regularity by reason—in addition to a shortage of machines—of the tendency for "joy-rides" to encroach upon the scheduled time-table. In fact, upon occasions, however pleased the joy-riders may have been, those waiting to be carried to over the Channel destinations, have not felt quite so satisfied. It is no doubt heartening to know that air-mindedness to this extent is spreading so rapidly, but regular air-line services should hardly bear the burden; rather should this side be left to the various concerns which lay themselves out to cater for the "joy-ride" side at Croydon—their legitimate "prey."

Hannibal had a spot of trouble early in the week, when the tail wheel collapsed at Le Bourget—in the hangar. Unfortunately, the "smaller fry" at the back were unable to get out until Hannibal could be removed some hours later!

The traffic figures for the week were:—Passengers, 1,912; freight, 101 tons.

P. B.

method of employing the aerodrome for this experimental period.



MUSIC AT HESTON: The EMG. Handmade Gramophone Co., Ltd., of 11, Grape St., W.C.2, have just installed this gramophone together with their amplifier for broadcasting music through a Phillips Loudspeaker at Heston Air Park. It has a range of three-quarters of a mile with extremely good quality of reproduction.



The Oldest and the Youngest. (FLIGHT Photo.)

CAMBRIDGE UNIVERSITY AIR SQUADRON

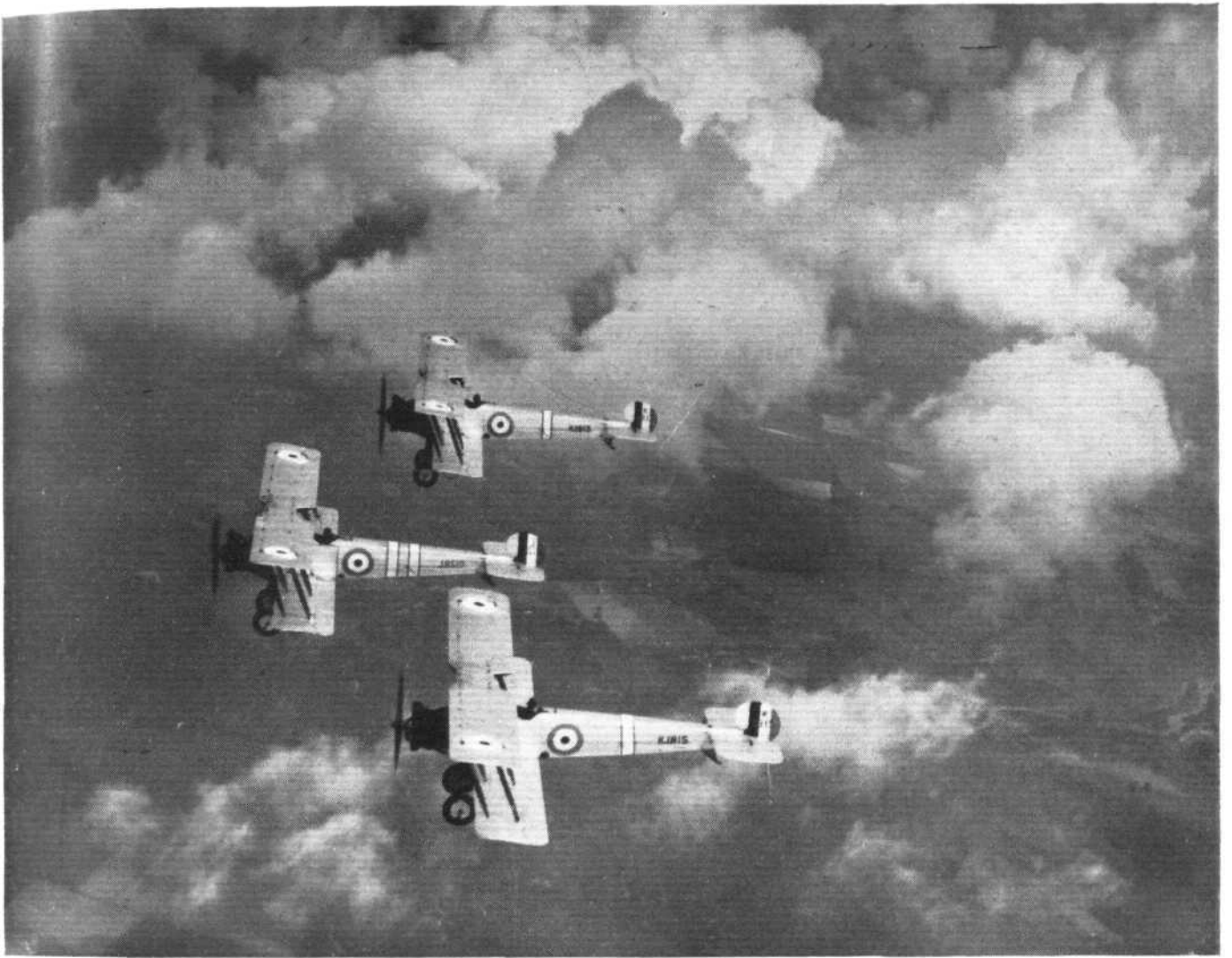
CAMBRIDGE University Air Squadron is now undergoing its annual attachment at the R.A.F. station of Old Sarum, and, unlike many other people in the country, has been enjoying the best of fine weather. The squadron numbers 75, apart from honorary members, and could easily recruit 150 if Treasury regulations would permit. The instructors find no difficulty in getting 75 men of the best quality; the only danger is that, when interviewing candidates, they may reject someone who would be a real asset to the squadron. During

term time training is carried out at Duxford aerodrome, where the Duxford station flight does what is needful to assist. The best work, however, is done during the six weeks' attachment at Old Sarum, which every member is expected to attend. The squadron is divided into three courses of 25 each, and every course spends a fortnight under canvas at the aerodrome. Seven flying instructors are there and 12 aeroplanes, namely, four Bristol Fighters and eight Avro-Lynx machines, not counting reserves. Before long the Bristols will be replaced by "Atlas" machines. The second of the three courses is now at Old Sarum.

How fortunate Cambridge has been in the matter of weather is shown by the number of hours flown. The first course this year put in 506 hours in the air, as against 419 by the first course last year. As no flying is done on Saturdays and Sundays, this works out at something over two hours a day per member, which must be reckoned a very good average. The instructors cannot have had very much time on the ground, but they say that it is easy work teaching undergraduates. The latter are—though this may not be accepted in the best Communistic circles—intelligent as well as athletic, and do what their instructors tell



CAMBRIDGE UNIVERSITY A.S.: Instructors and Members. (FLIGHT Photo.)



A CAMBRIDGE FORMATION OVER SALISBURY PLAIN: Light blue bands are painted round the fuselage, the chief instructor's machine having two bends. (FLIGHT Photo.)

them. Consequently they are quick to go solo on the Avros, and then on the Bristols. When a man is flying solo, streamers are attached to the struts to warn other pilots not to ride him off too hard.

Sixteen of the Colleges are represented on the list of members. Naturally, Trinity has the lion's share, not because the present Chief Instructor, Wing Commander F. P. Don, is a Trinity man (though he is doubtless pleased to see the flying enthusiasm of his own College), but simply because it is much the largest College at Cambridge. The men represent all sorts of University interests, and are reading all sorts of schools. The air squadron is by no means a close preserve for men of an engineering bent, though perhaps about 50 per cent. of the members have leanings that way. Classics, literature, modern languages, mathematics, theology, etc.—none of them proves a bar to correct manipulation of the joystick. The squadron at present includes one ex-officer from Sandhurst, who is reading for Holy Orders and has filled up his spare time by winning a half-mile Blue; a son of the Canadian Director of Civil Aviation; a son of the Chief of the South African General Staff, a son of the Iraqi

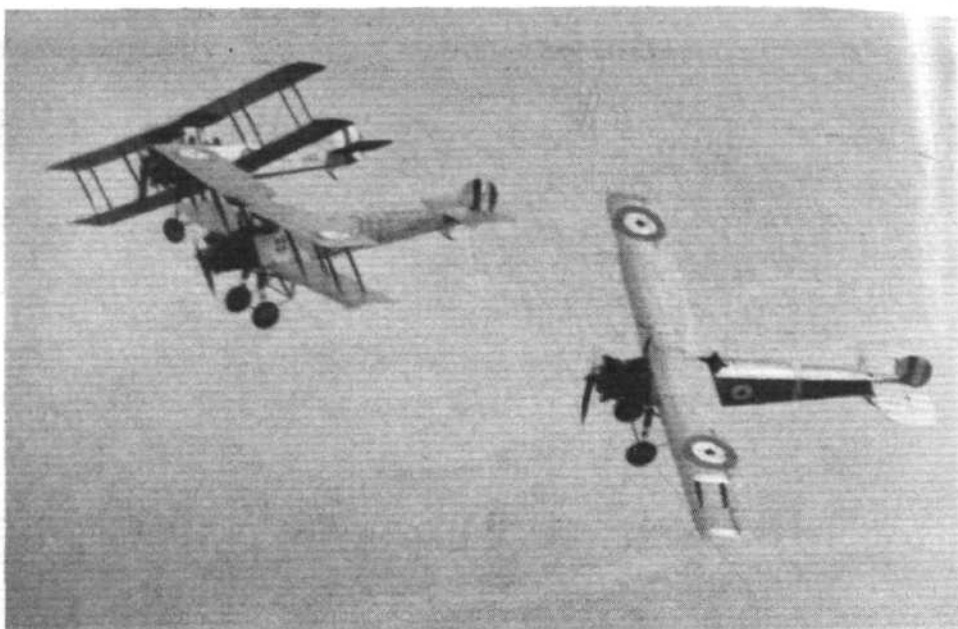


Members of the C.U.S.A. studying a map. (FLIGHT Photo.)

Minister, Nuri Pasha; and a son of one of the Petter brothers, of Yeovil, and of Westland fame.

When a man applies for membership of the squadron, he is asked to state his reasons for wanting to learn to fly. Many say that flying is the coming means of transport, and they think that they will have a better chance in life if they learn now. Some quite definitely say that they intend to seek careers overseas, in the Dominions or Colonies, and they are convinced that flying will help them in their work. Quite a number intend to apply for commissions in the Royal Air Force. To gain a University commission, a man must have been a member of the air squadron and must also have a degree. A man with a pass degree or third or fourth-class honours gets an ante-date of 12 months, while a man with first or second-class honours gets an ante-date of 18 months. This is only fair, for a University graduate is naturally somewhat older than an officer who has just passed out of Cranwell, and it may be taken that he brings into the Royal Air Force certain qualifications other than those of the Cranwell man. As he has spent time in gaining these qualifications, he is rightly given a compensating degree of seniority. Last year seven Cambridge men were given regular permanent commissions in the Royal Air Force, and one received a short-service commission. In addition to this, from 25 to 30 per cent. of the members hold commissions in the Reserve of Air Force Officers.

Last year the Cambridge squadron had one member who was an officer of No. 600 (City of London) (Bomber) Squadron, A.A.F., but he has just gone down. Speaking generally, the A.A.F. and Special Reserve Squadrons are not suitable for University men while they are in residence, as they do not always know where their future spheres of work will lie.



A Cambridge "Rag." (FLIGHT Photo.)

On our visit to the Cambridge squadron at Old Sarum on July 6, we were very pleased to make the acquaintance of the new Chief Instructor, or, in other words, the C.O., Wing Commander F. P. Don, of Trinity College, who has just succeeded Wing Commander Vernon S. Brown, now migrated to Henlow. The new C.O. lost an arm in the war, and was for some time a wounded prisoner in the hands of the Germans. He has recently commanded No. 502 (Ulster) (Bomber) Squadron, one of the cadre squadrons which comprises a proportion of Special Reserve personnel.

He has also served in Iraq. Though our visit to Old Sarum was necessarily short, we have no hesitation in saying that the excellent spirit of keenness, efficiency, and general good feeling which we have always found on our visits to the Cambridge University Air Squadron is still maintained.



A Bristol Fighter with the Arms of Cambridge University painted on the fin. (FLIGHT Photo.)

Boosting Aviation

THE Aviation Department of Selfridges are arranging a small exhibition to take place throughout the whole of next week. Mr. Gilbert will be in charge, and will be pleased to deal with inquiries from anyone interested in all sides of aviation. There will be on view an Autogiro, four or five engines, including specimens of the Salmson,

Cirrus Hermes, Armstrong-Siddeley Genet, and the new two-stroke Caunter. There will be a model of the new proposed King's Cross Aerodrome, which it is suggested should be built over that station; also several films will be shown, and many slides and photographs of everything to do with aircraft, and, if space will allow, a complete cockpit of a Redwing, and possibly of some other machines.

THE ROYAL AIR FORCE

London Gazette, June 30, 1931.

General Duties Branch

Group Captain F. K. Haskins, D.S.C., is appointed Aide-de-Camp to the King (July 1) (vice Group Captain E. D. M. Robertson, D.F.C., promoted to air rank). The following Pilot Officers are promoted to rank of Flying Officer: V. C. F. Streatfield (April 14), E. S. D. Drury, G. R. A. Elsmie, P. Heath, G. F. W. Heycock, B. H. Jones, W. H. Kyle, A. G. Teideman, R. L. Wallace (June 14).

The following are promoted with effect from June 30:—*Flight Lieutenants to be Squadron Leaders*.—P. J. Barnett, M.C., C. B. S. Spackman, D.F.C., R. T. B. Houghton, A.F.C., S. F. Vincent, A.F.C., D. R. W. Thompson, B. Ankers, D.C.M., W. K. Mercer, J. A. W. Binnie, E. G. Hilton, D.F.C., A.F.C., J. M. Mason, D.S.C., D.F.C., G. S. Oddie, D.F.C., A.F.C., A. P. Ledger, M.B.E., J. H. Butler, C. W. Hill, E. I. Bussell, G. M. Bryer, O.B.E., A.F.C., J. Whitford, C. Findlay, D.F.C., E. L. Ardley, L. G. Maxton, A.F.C., N. P. Dixon, A.F.C., E. Thornton, A. C. Sanderson, D.F.C., H. S. P. Walmsley, M.C., D.F.C., G. Martyn, D. V. Carnegie, A.F.C., C. R. Steele, D.F.C., J. W. Jones, G. O. Venn, E. W. Broadberry, M.C.

Flying Officers to be Flight Lieutenants.—A. A. Jones, P. J. Bell, G. V. Carey, H. M. G. Parker, J. H. McC. Reynolds, A. W. Elias, J. D. Greaves, L. C. Barling, E. J. George, J. V. Yonge, N. R. Buckle, C. H. Noble, G. E. Campbell, D.F.M., A. E. Taylor, R. J. Legg, R. R. Nash, W. E. P. Johnson, J. H. E. Jones, L. C. Bennett, E. S. Finch, D. N. Roberts, J. McGuinness, J. F. Moir, G. H. Shaw, I. J. Fitch.

Flying Officer R. S. Darbishire is restored to full pay from half pay (June 10); Squadron Leader B. F. Moore is placed on half-pay list, scale A (June 29); Flight-Lt. A. W. B. McDonald is placed on half-pay list, scale B (Aug. 5 to Sept. 15 inclusive); Flying Officer P. C. Fair takes rank and precedence as if his appointment as Flying Officer bore date May 15, 1929. Reduction takes effect from June 23. The following are placed on the retired list:—Squadron Leader A. E. Pettingell (June 30); Flight-Lt. A. H. Pearce, D.F.C. (June 29).

Squadron Leader F. W. H. Lerwill, O.B.E., is placed on retired list on account of ill-health (June 30); Wing-Commander T. R. Cave-Browne-Cave, C.B.E., is placed on retired list at his own request (July 1); Flying Officer K. E. Parker is transferred to Reserve, Class A (June 1); Flying Officer K. G. Vandeyck relinquishes his short service commn. on account of ill-health (July 1). The short service commns. of the following Pilot Officers on probation are terminated on cessation of duty (June 24):—W. O. J. Coke,

G. H. Davies, M. H. Formby. Lt. S. Borrett, R.N., Flying Officer, R.A.F., ceases to be attached to R.A.F. on return to Naval duty (June 21); Pilot Officer J. Grierson is removed from Royal Air Force (June 23).

Stores Branch

Flying Officer C. J. Cousins is placed on retired list on account of ill-health (July 1).

Accountant Branch

Pilot Officer on probation C. A. Proffitt is confirmed in rank and promoted to rank of Flying Officer (June 2).

Dental Branch

Flying Officer M. J. Pigott, B.D.S., is promoted to rank of Flight-Lieut. (June 17).

Chaplains Branch

The Rev. D. F. Stephens, M.A., relinquishes his short service commn. on completion of service (July 1).

Erratum

In Gazette of Dec. 12, 1919:—For 2nd Lt. C. A. Stubings, read Lt. C. A. Stubings.

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

A. M. West is granted a commn. in Class A as a Flying Officer (June 30); T. J. R. Cornwall-Walker is granted a commn. in Class C as a Flying Officer (June 30). The following Pilot Officers on probation are confirmed in rank:—C. D. Pitman (June 16); A. I. A. McDougall (June 19); E. L. Briggs (June 25); G. D. M. Blackwood (June 26). Flying Officer C. D. Jennery is transferred from Class A to Class C (June 26). The following Flying Officers are transferred from Class AA (ii) to Class C:—B. B. F. Russell (March 17, 1930); I. B. Sherring (June 21).

Pilot Officer B. N. H. Thornely is transferred from Class C to Class AA (ii) (June 9); the commn. of Pilot Officer on probation B. P. Turner is terminated on cessation of duty (June 3); the commn. of Pilot Officer on probation G. M. E. Speedy is terminated on cessation of duty (May 23). (Substituted for Gazette June 16.)

AUXILIARY AIR FORCE

General Duties Branch

No. 601 (COUNTY OF LONDON) (BOMBER) SQUADRON.—Flying Officer T. J. R. Cornwall-Walker resigns his commn. (June 30).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commanders: H. P. Lale, D.S.O., D.F.C., to Station H.Q., Netheravon, to command, 1.6.31. L. L. MacLean, to R.A.F. Depot, Uxbridge, on transfer to Home Estab., 30.5.31.

Squadron Leader R. M. Drummond, D.S.O., O.B.E., M.C., to Station H.Q., Manston, 22.6.31.

Flight Lieutenants: J. McFarlane, M.C., A.F.C., to R.A.F. Training Base, Leuchars, 22.6.31. S. H. Reynolds, to R.A.F. Depot, Uxbridge, 13.6.31. W. A. Harvey, to R.A.F. Depot, Uxbridge, 22.6.31.

Flying Officers: R. S. Darbishire, to No. 210 Sqdn., Felixstowe, 10.6.31. W. F. Murray, to Marine Aircraft Experimental Estab., Felixstowe, 13.6.31. R. Jones, to R.A.F. Depot, Uxbridge, 8.6.31. D. S. King, to R.A.F. Depot,

Uxbridge, 8.6.31. H. C. Friday, to Elec. & Wireless School, Cranwell, 22.6.31. D. A. Messiter, to R.A.F. Depot, Uxbridge, 23.4.31.

Stores Branch

Flight Lieutenant R. F. Wilson, to R.A.F. Depot, Uxbridge, 26.4.31.

Medical Branch

Wing Commander A. E. Panter, to Princess Mary's R.A.F. Hospital, Halton, for duty as Commanding Officer, 7.7.31.

Flight Lieutenant E. A. Rice, to Station H.Q., Andover, 7.7.31.

NAVAL APPOINTMENTS

The following appointments were made by the Admiralty yesterday:—Lieut. (F.O., R.A.F.).—C. A. Kingsley-Rowe, to *Renown* (August 13).

R.A.F. SPORT

Cricket

THE Army beat the Royal Air Force in the match played at the Oval on July 4 and 6 by an innings and 37 runs. Scores:—

ROYAL AIR FORCE

First Innings		Second Innings	
Sergeant T. O. Pollitt, b. Gore	6	c. Robins, b. Gore	14
Flying-Officer E. G. Huddleston, c. Gore, b. Burrows	38	l.-b.-w., b. Howlett	17
Flying-Officer G. B. Longfield, c. Hugonin, b. Howlett	1	c. Burrows, b. Howlett	2
Flying-Officer W. K. Beiseigle, l.-b.-w., b. Burrows	0	c. Hugonin, b. Dynes	20
Flight-Lieut. A. J. Holmes, c. Leggett, b. Howlett	13	c. and b. Robins	59
Pilot Officer D. R. S. Bader, c. Dynes, b. Gore	65	c. E. S. B. Williams, b. Dynes	1
Squadron Leader B. E. Baker, c. Hugonin, b. Gore	20	st. Hugonin, b. Dynes	0
Squadron Leader R. E. Fulljames, st. Hugonin, b. Gore	27	b. Dynes	47
Flight-Lieut. C. D. Adams, c. Gore, b. Howlett	4	c. McGaw, b. Robins	8
Flight-Lieut. D. MacFadyen, b. Gore	1	b. Dynes	1
Flight-Lieut. F. S. Hodder, not out	1	not out	10
Byes, 6; l.-b., 7; n.-b., 3	16	Leg-byes 4; n.-b., 4	8
Total	192	Total	187

THE ARMY.—First Innings

Major A. C. Wilkinson, c. Fulljames, b. Longfield	74
W. V. H. Robins, c. Huddleston, b. Adams	13
Lieutenant-Colonel E. S. B. Williams, c. Pollitt, b. Fulljames	66
W. M. Leggett, l.-b.-w., b. Hodder	28
L. Williams, c. Hodder, b. MacFadyen	103
E. D. Dynes, c. Pollitt, b. Fulljames	55
Captain M. B. Burrows, c. Adams, b. Fulljames	2
A. J. T. McGaw, c. Baker, b. Fulljames	0
Captain F. E. Hugonin, b. MacFadyen	44
A. C. Gore, c. Baker, b. Longfield	13
Captain B. Howlett, not out	2
Byes, 8; l.-b., 8	16
Total	416

BOWLING ANALYSIS

ROYAL AIR FORCE—First Innings

	O.	M.	R.	W.		O.	M.	R.	W.
Gore	21	3	51	5	Burrows	7	1	22	2
Howlett	19	2	80	3	Dynes	2	0	9	0
McGaw	10	5	14	0					

Second Innings

	O.	M.	R.	W.		O.	M.	R.	W.
Gore	16	3	32	1	Dynes	11	2	1	31
Burrows	7	0	29	0	McGaw	6	5	3	0
Howlett	12	1	46	2	Robins	8	1	38	2

THE ARMY.—First Innings

THE ARMY—First Innings										
	O.	M.	R.	W.		O.	M.	R.	W.	
Adams ..	24	0	91	1	Fulljames ..	29	3	89	4	
MacFadyen ..	25	2	4	59	2	Longfield ..	16	1	51	2
Hodder ..	28	5	69	1	Holmes ..	9	0	41	0	

UMPIRES—Daly and Bullock.

Stores Officers—Royal Air Force

THE Air Ministry announces that about five vacancies for permanent commissions in the Stores Branch of the Royal Air Force will be offered for competition among young men of between 23 and 25 years of age on January 1, 1932, who have had not less than five years' business experience in a firm of standing. This will be the sixth competition under the scheme inaugurated in 1926 for the purpose of obtaining men with a business training to control and administer the supply of the highly valuable and complex equipment of the Royal Air Force. From among those who apply a limited number of candidates will be selected to proceed to the examination, which will be held in London in the latter part of October, 1931, and will consist of two parts, an interview before a board and a written examination. The written examination will be of such a character that men of good general education can take it without special study.

Accepted candidates will be gazetted to commissions as Pilot Officers on probation, and will receive six months' training in their future duties. After a year's satisfactory service, they will be eligible for confirmation in their appointments and for promotion to the rank of Flying Officer. Promotion above the rank of Flying Officer will be by selection, subject to passing a qualifying examination. The emoluments of Officers in the Stores Branch, including the value of quarters, rations, and services in kind, or cash allowances in lieu, range at present from approximately £340 a year for an unmarried Pilot Officer, and £370 a year for a Flying Officer on promotion, to £1,150 a year for a married Group Captain (the highest rank for which provision is made). The expenses in Royal Air Force messes are strictly regulated so that Officers even of the most junior rank can live upon their pay.

MODELS

THE MODEL AIRCRAFT CLUB (T.M.A.C.)

INAUGURAL Meeting of 3rd Wing T.M.A.C. (De Havillands).—Saturday, July 4, was very unkind in the matter of weather, a high and gusty wind, with occasional showers of rain, made the flying of models a very questionable operation.

Owing to the regrettable absence of Captain Geoffrey De Havilland (owing to illness) the diploma of inauguration was accepted by Mr. F. T. Hearle, who very kindly stepped into the breach, and in a short but well-chosen speech gave his promise of support and co-operation on behalf of Captain De Havilland and his fellow directors. He then referred to the experiments carried out with models prior to the launching of the first D.H. machine, and offered the hope that as many successes should attend the efforts of members of T.M.A.C. as had followed the experiments and practices of the De Havilland Company.

Owing to the weather, the Farrow Shield Competition was postponed, and will be held early in August. General flying was carried out until 4.30 p.m., when everyone adjourned to the pavilion for tea, which was admirably served and thoroughly enjoyed, thanks solely to efforts of Captain and Mrs. Eden, Mr. Gow, Mr. G. H. Clark and the lady secretaries of the company.

All Wings of T.M.A.C. were well represented, but the outstanding flying of the meeting was undoubtedly the consistent performance of members of the 4th Wing, under Mr. M. R. Knight.

Flying and social activities continued both inside and outside the pavilion until a very late hour. Some members had been taken round the works during the morning, and so their day was very full when 10 o'clock came, and a very tired but happy crowd of enthusiastic aero-modellists bade farewell and thanks to Captain Eden and his secretaries and all members of De Havillands, who spared no effort and fully succeeded, in spite of poor weather, in making the inauguration of the 3rd Wing a day to be remembered in the annals of T.M.A.C.

Cinema films were taken, but the poor light prevailing may affect the results obtained, but all members will have an opportunity of seeing these when developed if they arrange a date with the organising secretary.

4th Wing, T.M.A.C., Hackney Marsh.—June has been a very busy month at Hackney Marsh. Some exceptionally well-attended meetings have been held, and 31 different models flown (15 low-wing, 12 high-wing, 4 biplanes, and 1 Spar Mono). The weather, though improved, has been tricky enough to give members excellent practice in trueing and launching models.

Successful parachute-dropping experiments have been made by Messrs. Jope, Wood, and J. Beard.

Five new types have been flown, and have given a good account of themselves: Mr. Jope's H.W. Gemsbok, Mr. Burt's L.W. Cheetah, Mr. J. Beard's biplane Banshee, Mr. Andrews' Puss-Moth, and Mr. Knight's Cabin H.W. Kittiwake III. One new Kitten has been produced.

Fourteen members represented us at the Inaugural Meeting of 3rd Wing, Stag Lane, and put up some good displays, despite boisterous weather.

14th Wing, T.M.A.C. (Woodley Aerodrome, Reading).—The membership is slowly creeping up, and there are many "perspective" members attached. Much enthusiasm is evinced, and the season should produce some excellent models.

Field meetings were held on June 20 and 27, and an indoor on July 1. The most interesting machine is a tractor R.O.G., driven by compressed air (3 cyl.) by T. Mann.

Several semi-scale tractors—one of balsa—have been flying well, but not near record standard. One or two of the younger people have built successful spar tractors and pushers, and are gaining good experience in adjustments and construction.

On June 27 the Wing Commander had a glide of $\frac{1}{2}$ min. after a flight of 40 sec. This was with a double-surfaced twin-pusher. A 4-ft. Flemming-William type did regular 400 yd. over the ground.

We hope many T.M.A.C. members from other Wings will turn up on July 25 at Woodley Aerodrome, Reading, to the first big meet.

A workshop has been secured in the town.

17th Wing, T.M.A.C., North-Western Centre. Squadrons Nos. 50, 51 and 52.—An amount of flying was done at the old Aerodrome, Mauldeth Road, Withington, on Saturday and Sunday, July 4 and 5.

The 51st Squadron's models, "Crusader" high-wings,

were flown by Masters Hodson and Sharples, the former achieving 55 sec. on the Saturday. These are their first models, and they are nicely constructed, which speaks well for the 17th Wing's method of forming instructional classes for new members who are building their first machine. Another class starts on July 13, so intending members should try and join this class.

Nine fuselage models were in the air on Sunday, and, in spite of a strong wind, some good flights were witnessed. Mr. Larmuth came along with his heavy-weight, and treated us to some high flying. Mr. Robinson's ditto showed some constructional weaknesses, and Mr. Royle's small high-wing put up some good flights, but the best flying of the small fry came from the "Crusaders."

The high wind, however, spoilt all performances. Mr. Kenworthy's "Condor V" got away to 80 sec. on two occasions, but this was poor compared with a flight earlier in the week of 140 sec.

Those interested in model aircraft in the district are invited to meet us at the Manchester Airport, Barton, on July 11, at 3.30 p.m.

PUBLICATIONS RECEIVED

Der Kumpf um Nobile. By Willy Meyer. Gebr. Radetzki, Berlin, S.W.48. Price 12 Mk.

Gambler's Throw. By Eustace L. Adams. London: John Hamilton, Ltd. Price 7s. 6d.

NEW COMPANIES REGISTERED

THAMES TAXIS, LIMITED, 265, Strand, W.C.2. Capital £3,000, in 2,000 7 per cent. cumulative participating preference shares of £1 each and 5,000 ordinary shares of 4s. each. Manufacturers, hirers and operators of water and aircraft, general engineers, etc. Directors: R. W. Brown, Long Ashton, Hutton, nr. Brentwood, engineer; S. T. Manuel, 1, Bramerton Street, Chelsea, S.W., engineer; E. P. Whitney, Broad Oak, Groombridge, Kent, farmer.

MECHANISM, LTD., 6A, George Street, Croydon. Capital £1,000, in £1 shares. Mechanical, aeronautical and electrical engineers, scientific instrument makers, electricians and dealers in electric, aeronautical and other apparatus, etc. Directors: G. D. K. Moss, 33, Selby Road, Anerley, S.E. 20, engineer, and H. C. Peirce, The Wedge, Eliot Place, Blackheath, S.E. 3.

AERONAUTICAL PATENT SPECIFICATIONS

(Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

Applied for in 1930

Published July 9, 1931

- 1,307. W. W. TRIGGS. (Bendix Aviation Corporation.) Means for detachably connecting grease-feeders to grease receiving devices. (350,503.)
- 1,456. PETERS, LTD., and G. T. R. HILL. Air brakes. (350,504.)
- 7,408. W. E. GRAY. Air brakes. (350,475.)
- 7,597. J. HAYDOCK, JUN., and C. SHORROCK. I.c. rotary engine. (350,527.)
- 8,283. WESTINGHOUSE BRAKE AND SAKBY SIGNAL CO., LTD. Aircraft braking apparatus. (350,555.)
- 10,559. ARMSTRONG SIDDELEY MOTORS, LTD., and D. L. PRIOR. Gearing for driving supercharger. (350,629.)
- 11,028. VICKERS (AVIATION), LTD., R. K. PIERSON and G. STANNARD. Aircraft, etc. (350,636.)
- 11,446. BOULTON AND PAUL, LTD., and J. R. NORTH. Cowlings for air-cooled engines. (350,646.)
- 14,153. CHANCE BROS. AND CO., LTD., and H. E. E. GOODMAN. Aircraft lights. (350,673.)
- 17,808. H. AND M. FARMAN. Transmission gears. (350,722.)
- 20,006. MASCHINENFABRIK AUGSBURG-NURNBERG. A.-G. Two-stroke cycle i.c. engines for aircraft. (350,753.)
- 21,907. S. SOKAL. (Flat Soc. Anon.) Landing gear. (350,784.)
- 24,025. GOODYEAR-ZEPPELIN CORPORATION. Superstructures for rigid airships. (350,804.)

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